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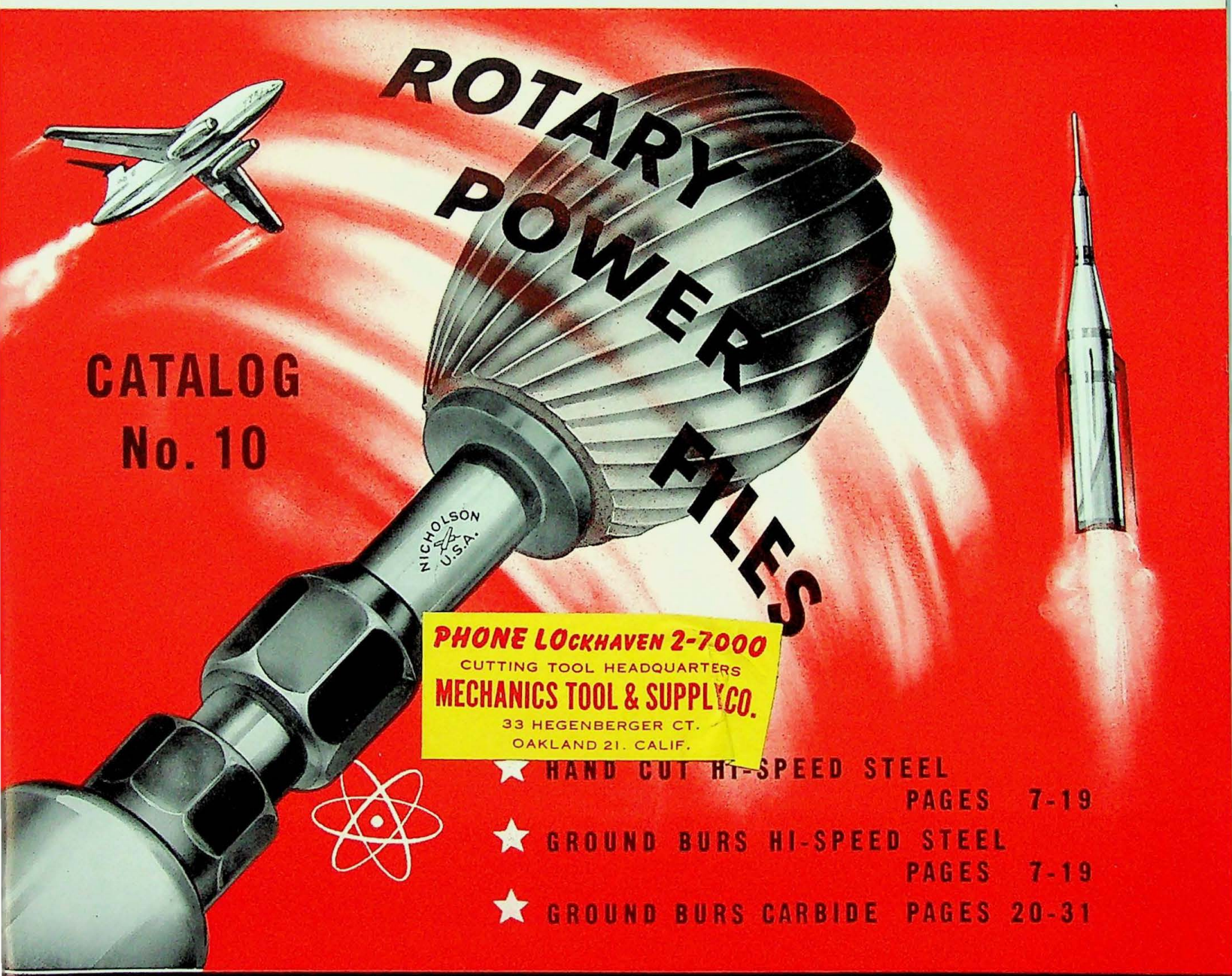

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NICHOLSON FILE COMPANY

ROTARY POWER FILES

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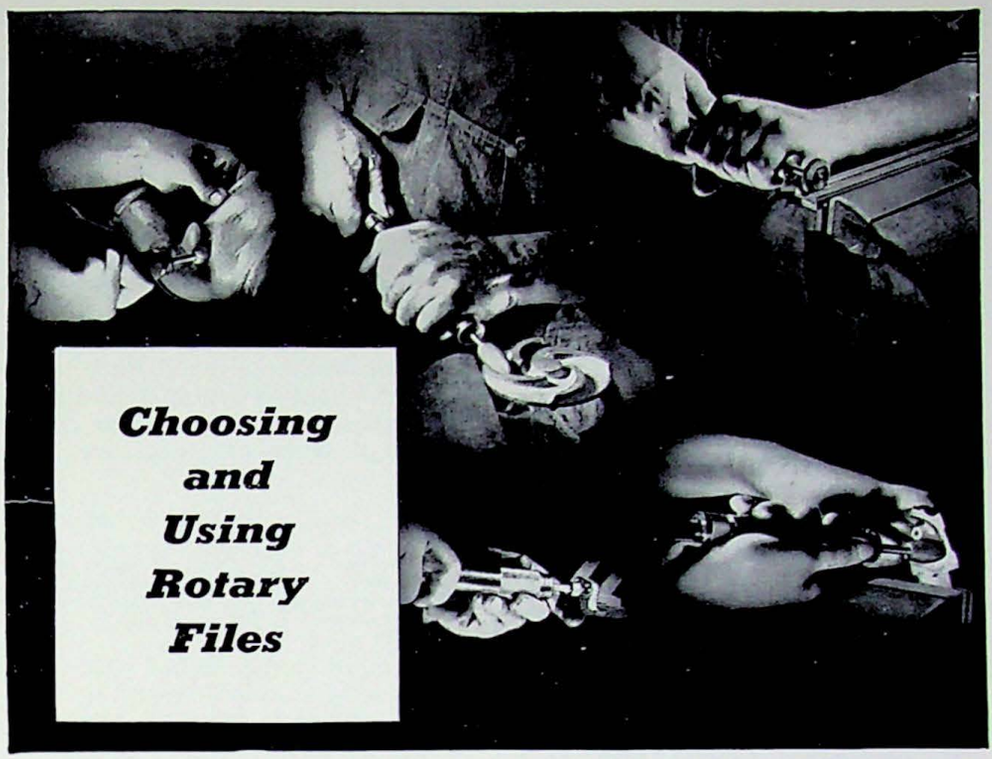
FACTS ABOUT ROTARY POWER FILING



Choosing and Using Rotary Files

If you are considering power filing as a method of abrading or smoothing metal—and it's a mighty fine method for certain jobs—you have a choice of Hand Cut Rotary Files or Ground from Solid Burs—the latter type being made either from High Speed Steel or Carbide. The purpose of this section is to discuss their uses, explain their anatomy, analyze their advantages, and warn you against their limitations; to suggest the best methods of using these power tools; and to recommend approximate speeds at which they can be operated.

First let us consider the general applications of these power driven hand tools throughout industry, following through with the other data just mentioned.

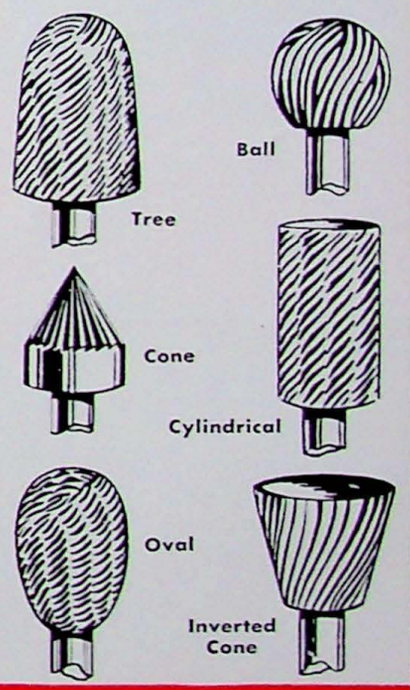
Both types—Rotary Files and Ground Burs (High Speed and Carbide)—are widely used in die sinking, metal pattern making, mold finishing, tool making and finishing small and intricate parts. In such work they are used for breaking and chamfering corners, removing burs and fins; for elongating holes and slots and other hard to get at places. Name almost any metal working plant and you find a potential field for power filing.

The aviation industry uses Burs on Aluminum and Magnesium, frequently finding the "Tree Shapes" with tapered points or blunt noses suitable for its particular applications; and the Oval Shapes are equally valuable. If you visit a machine tool manufacturer you'll probably discover Power Files at work on such jobs as "balancing" cast iron pulleys. Makers of fire fighting equipment touch up such parts as brass nozzles, prior to polishing.

In Pattern Shops, the Ball Shape forms fillets of metal match plates and removes burs in drilled holes, especially on concave or convex surfaces. The Inverted Cone Shape is just right to get at the corners of sheet metal boxes where the excess metal is to be removed.

This, of course, is only a partial and suggestive list of applications which would run into hundreds. In using Rotary Files and Ground Burs instead of abrasive stones and grindstone tips, the filer has the advantage of greater speed and the knowledge that his tools will not clog or grime up, shatter or break.

STYLES FOR EVERY PURPOSE



Rotary Files and Burs

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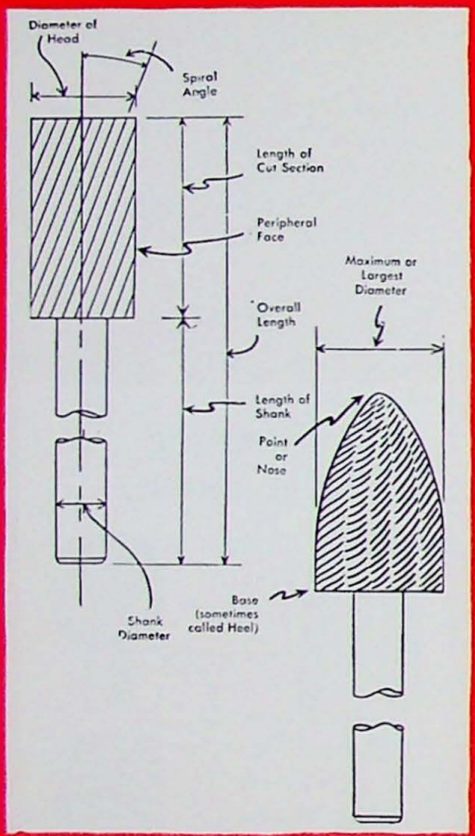
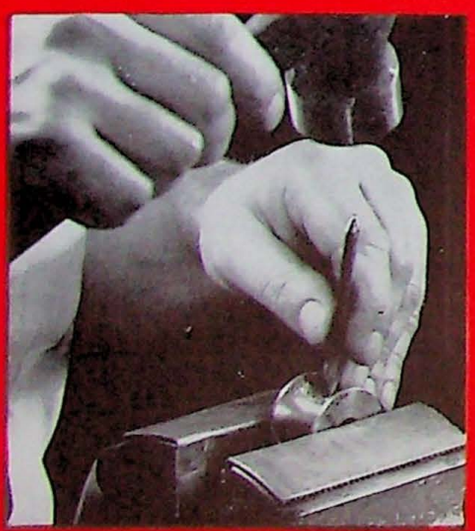




Precision Hand Cutting

ANATOMY

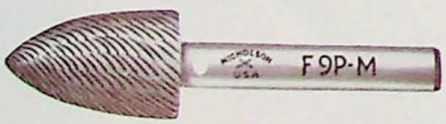
Rotary Files and Burs may be defined as power tools, used with flexible shaft or stationary shaft machines, portable electric or air tools, with teeth or flutes cut or ground on the surface and used for abrading and smoothing metals and other materials.

Expanding this definition, we find that the business end of the tool is the "head" or "cut section" and that these heads come in a variety of shapes from the Cylindrical to the Tree Shaped, Ball and Inverted Cone. Length usually refers to head or cut section. Tip is called the point or nose depending on whether it is rounded or pointed. The part of the head from which the shank extends is called the "base" or the "heel". The teeth or flutes generally come in three degrees of coarseness; i.e., coarse (C), medium (M), and fine (F)—the choice depending on the amount of stock to be removed and the finish desired. Shanks are usually ¼" in diameter on Files and Burs used for heavy and medium jobs; ⅛" when the tool is designed for use on relatively delicate operations.

HAND CUT VERSUS— GROUND FROM SOLID

We now start to appraise the differences between the Hand Cut and Ground, each made from High Speed Steel.

As their name indicates, Hand Cut Rotary Files are cut by an expert hand-cutter, using a hammer and a chisel to cut or form each tooth. Although he may have a blueprint to guide him, the hand-cutter depends upon his ability to hold the chisel at just the correct angle and to strike a blow of just the right force.

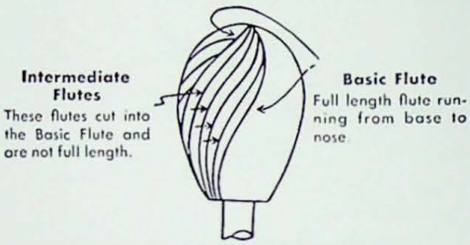


Rotary File

Because the teeth of Hand Cut Rotary Files are "broken up", in contrast to the "unbroken flutes" of the ground bur, they are better fitted for work on tough and dense metals. These teeth seem to dissipate the heat created by the friction of the file on this type of material. Therefore they are recommended for tough die steels, steel forgings, or any scaly tough dense surface or metal.

GROUND BURS

Ground Burs are cut with a series of unbroken flutes instead of the "broken up" teeth characteristic of Hand Cut Files. Basic flutes extend the full length of the cutting head, from the base to the nose; and intermediate flutes cut into the basic flutes at appropriate places.


Intermediate Flutes
These flutes cut into the Basic Flute and are not full length.
Basic Flute
Full length flute running from base to nose.

Basic Flute together with Intermediate Flutes cutting into Basic Flute is designated as a "Section".

Some ground burs are made with "alternate fluting," which means that every other flute extends to the extreme point of the tool.

Ground Bur

The flutes of the Ground Bur are cut by an operator using a grinding wheel. While a "free hand" method of grinding is quite common, the Nicholson method calls for precision machine grinding which insures accuracy of shape and even tooth height around the periphery, the latter feature eliminating jumping, vibration and non-uniform wear. Each bur is cut on a machine actuated by a master bur guaranteeing absolute uniformity of burs of the same type and size, no matter how many are produced.

In general, Ground Burs are more efficient than Hand Cut Rotary Files on non-ferrous metals such as Aluminum, Brass, Bronze and Magnesium. Because of the ductility peculiar to these metals, burs are ideal cutting tools, since their ground teeth free themselves readily of chips.

NICHOLSON U.S.A.

TIPS ON USING FILES AND BURS

Rotary Files and Ground Burs can be used in drill presses, lathes and electrically or air operated hand or flexible shaft equipment. There is very little difference in the efficiency of Files or Burs in electric tools as compared to air tools, providing that the speeds have been reasonably well selected. The choice between electric and air tools is usually determined by the equipment which is available in a given plant.

The following principles should help the user toward the best results:

A—Move the file or bur at an even rate and pressure to avoid the "hills and dales" which will show up if an unsteady pressure is applied.

B—The speed at which the bur can be driven depends to a great extent on the size of the bur. The smaller the bur, the faster the speed. (See Chart)

C—Be sure to use sharp files or burs. Never overlook the fact that the operator's time is the big cost item and he needs well sharpened tools. (Nicholson provides an excellent resharpening service.)

D—Use a short grip on the shank for accurate control and a longer grip for reaching the out of the way places.

E—Normally, medium cut Files or Burs will give sufficient stock removal and acceptable finish to meet most needs. However if heavier cutting or greater stock removal is required, coarse cut should be used, and correspondingly, the fine cut should be selected if a very smooth finish is required.

HOW ABOUT SPEEDS

It is extremely difficult to give the correct recommendations because the speed is bound to vary with the skill and technique of the operator; the type of power which is being used; the material which is being removed or finished; and the type of operation-finishing, stock removal, etc. A certain amount of flexibility is obtained in that higher speeds than normal tend towards a better finish but less stock removal; while slower than normal speeds give greater stock removal but a poorer finish.

The table below is given in revolutions per minute rather than in surface feet per minute because the former are more conveniently used. It is very important, however, that any table of speeds should specify the diameter of the bur which is to be used at the recommended speed, because the surface feet per minute is the basis of calculation.

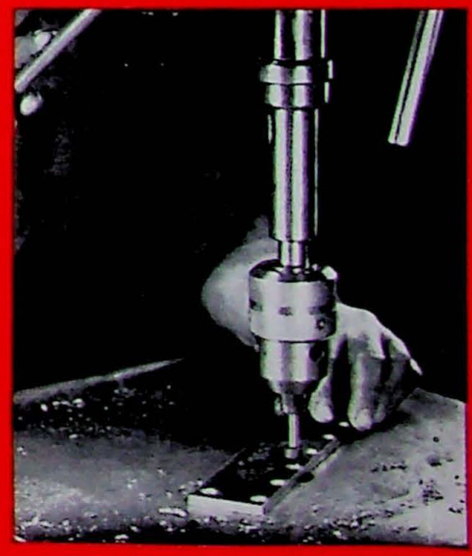
Undoubtedly many instances can be cited in which burs have been used successfully at speeds much higher than those in our table. The best way is to determine from experience what speeds will give the most satisfactory results on a particular job. It should also be borne in mind that flexible shaft machines have a limited number of speeds and that these govern to a considerable extent the revolutions per minute which can be used.

APPROXIMATE SPEEDS (R. P. M.) FOR HIGH SPEED STEEL ROTARY FILES AND BURS IN MEDIUM CUT.

Head Dia.	Mild Steel	Cast Iron	Bronze	Aluminum	Magnesium
1/8"	4600	7000	15000	20000	30000
1/4"	3450	5250	11250	15000	22500
3/8"	2750	4200	9000	12000	18000
1/2"	2300	3500	7500	10000	15000
5/8"	2000	3100	6650	8900	13350
3/4"	1900	2900	6200	8300	12400
7/8"	1700	2600	5600	7500	11250
1"	1600	2400	5150	6850	10300
1 1/8"	1500	2300	4850	6500	9750
1 1/4"	1400	2100	4500	6000	9000

FACTS ABOUT ROTARY POWER FILING (CONTINUED)

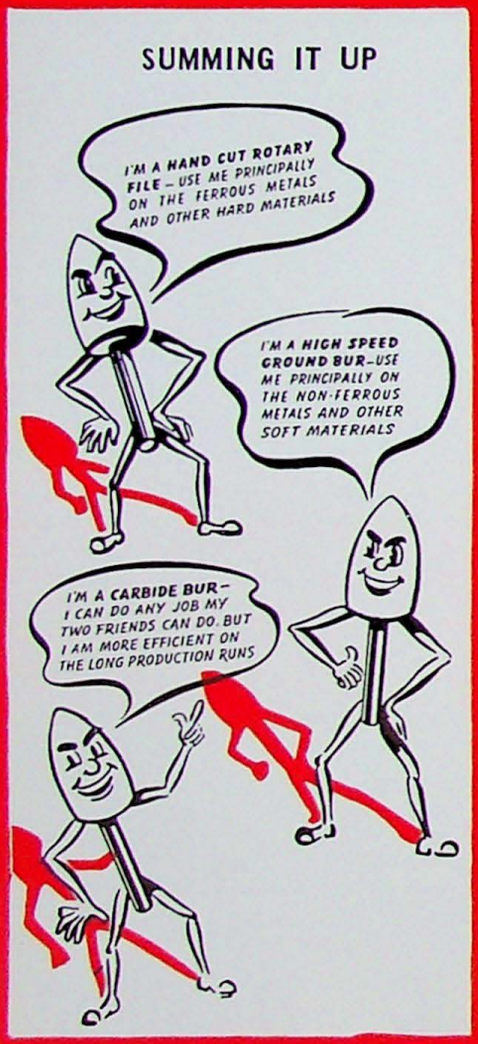
A Bi Shaped Bur smoothing edges of concave section. Flexible shaft machine is used.



Cone Shaped Bur in Drill Press Deburring drilled holes in plate.

FACTS ABOUT ROTARY POWER FILING (CONTINUED)

SUMMING IT UP


I'M A HAND CUT ROTARY FILE – USE ME PRINCIPALLY ON THE FERROUS METALS AND OTHER HARD MATERIALS
I'M A HIGH SPEED GROUND BUR – USE ME PRINCIPALLY ON THE NON-FERROUS METALS AND OTHER SOFT MATERIALS
I'M A CARBIDE BUR – I CAN DO ANY JOB MY TWO FRIENDS CAN DO. BUT I AM MORE EFFICIENT ON THE LONG PRODUCTION RUNS

NICHOLSON CARBIDE BURS

The Carbide Bur is one of the most recent developments among modern cutting tools. It has tremendous possibilities for reducing burring costs, in its particular applications, foremost of which is likely to be found on long production runs.

For example, it has been demonstrated that a Carbide Bur will last up to one hundred times as long as a High Speed Steel Bur of corresponding shape and size. On the other hand, it costs about fifteen times more. Assuming that the production life of the Carbide Bur is seventy-five times greater and the cost fifteen more, there is a ratio of five to one in its favor. And there are other factors.

The Carbide Bur may be used on hard or soft materials with equally good results. Made of extremely hard material, the flutes of the Carbide Bur will retain their maximum cutting efficiency a great deal longer than those made of High Speed Steel thus eliminating change over costs. A skillful operator, especially if he is working on a piece or bonus system, appreciates the fact that his tool is working at full efficiency and not reducing his earning power because it is partly worn out—although not sufficiently worn to be discarded.

ANATOMY

The anatomy of the Carbide Bur is much the same as that of the High Speed Bur, the principal difference lying in the fact that the former is made of Carbide. Of course, the rake and coarseness of teeth are changed somewhat to conform to the peculiarities of Carbide, the negative rake rather than the radial producing a construction of the greatest strength.

Most carbide burs have index fluting, meaning that all flutes converge to a common point.

Diamond Cut Carbide Burs are recommended for tough die steels. These "double cut" burs have flutes that intersect each other, as illustrated on page 20. These throw off small, irregular particles, rather than sharp pointed slivers.

TAKE CARE OF 'EM

The Carbide used in these burs has the highest Rockwell Hardness consistent with necessary toughness. While every effort is made to combine hardness and toughness, Carbide Burs are nevertheless relatively brittle and must be treated more gingerly than an ordinary bur. They cannot stand as much abuse. Under no circumstances must they be tossed onto a bench or into a tool box where their cutting edges may be damaged. Remember that if one Carbide Bur is injured—the loss is about fifteen times as great as that of a High Speed Bur—and savings are greatly reduced.

COARSENESS CHART

ROTARY FILES

Dia. Inches	Teeth Per Inch		
	Coarse	Medium	Fine
1/8	14	20	30
3/16	14	20	30
1/4	14	20	30
5/16	12	18	27
3/8	12	18	27
7/16	12	18	27
1/2	12	18	27
5/8	12	18	27
3/4	12	18	27
7/8	12	18	27
1	10	15	24
1 1/8	10	15	24

GROUND BURS H.S.

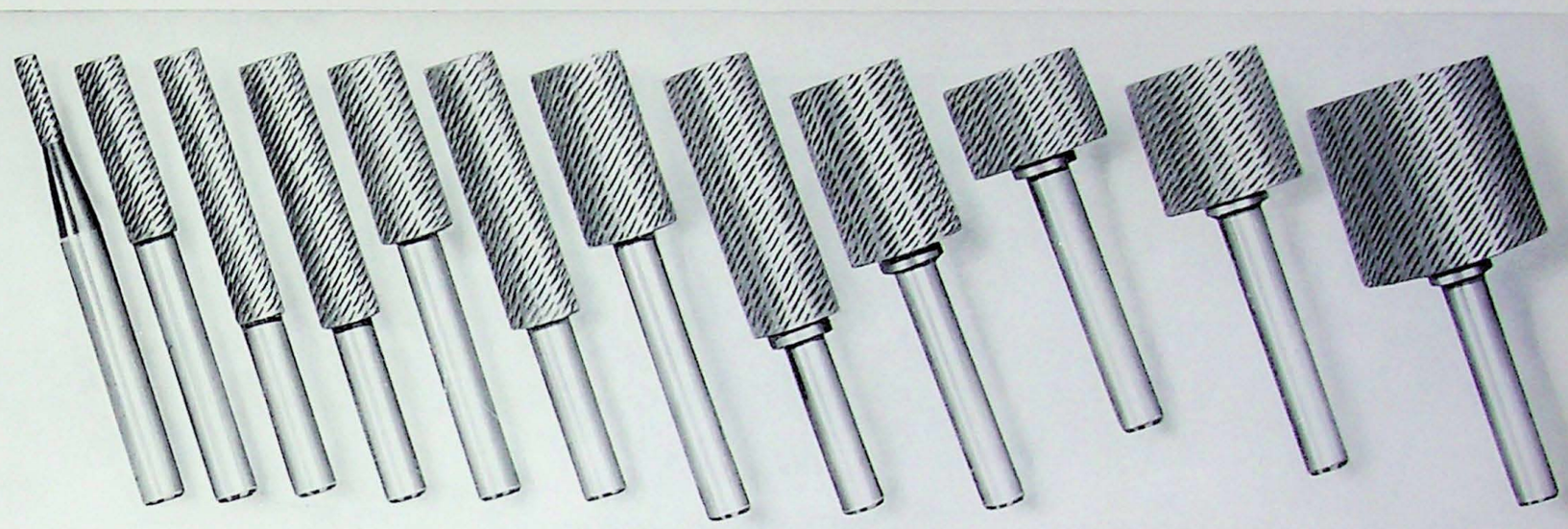
Dia. Inches	Flutes Per Circumference		
	Coarse	Medium	Fine
1/8	7	10	16
3/16	9	13	20
1/4	10	16	24
5/16	12	18	27
3/8	14	20	30
7/16	15	22	33
1/2	16	24	36
5/8	18	27	40
3/4	20	30	45
7/8	22	33	49
1	24	36	54
1 1/8	26	39	57

CYLINDRICAL SHAPE FLAT END

Made of Hi-Speed Steel

Stocked in Coarse, Medium and Fine Cuts

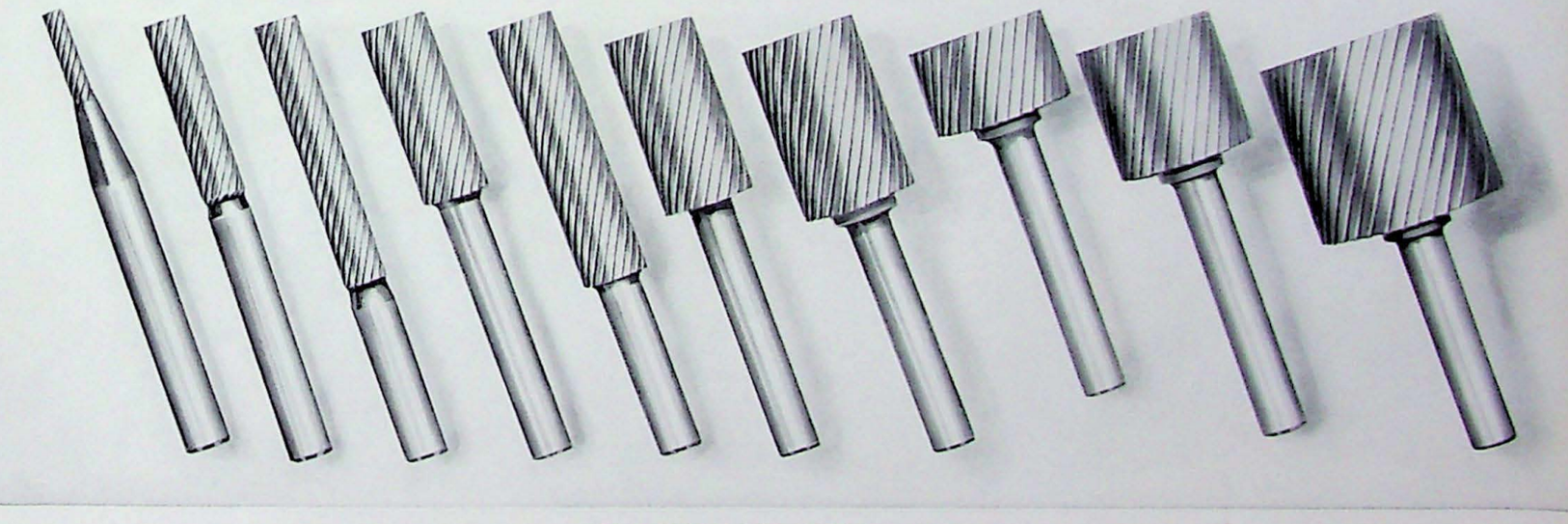
NICHOLSON HAND CUT ROTARY FILES AND GROUND FROM SOLID BURS — WITH 1/4" SHANKS



HAND CUT STYLE "A"

Number→	A 1 G*	A 3 P*	A 3 U	A 4 U	A 5 P	A 5 U	A 7 P	A 7 U	A 9 P	A 10 G	A 10 K	A 14 P
Diameter by Length	1/8 x 1/2	1/4 x 1	1/4 x 1 1/2	5/16 x 1 1/2	3/8 x 1	3/8 x 1 1/2	1/2 x 1	1/2 x 1 1/2	5/8 x 1	3/4 x 1/2	3/4 x 3/4	1 x 1

*Have uncut ends but can be supplied with cut ends at small additional charge. All other "A" shapes have cut ends.



GROUND BUR STYLE "N"

Number→	N 1 G	N 3 P	N 3 U	N 4 P	N 5 P	N 5 U	N 7 P	N 9 P	N 10 G	N 10 K	N 14 P
Diameter by Length	1/8 x 1/2	1/4 x 1	1/4 x 1 1/2	5/16 x 1	3/8 x 1	3/8 x 1 1/2	1/2 x 1	5/8 x 1	3/4 x 1/2	3/4 x 3/4	1 x 1

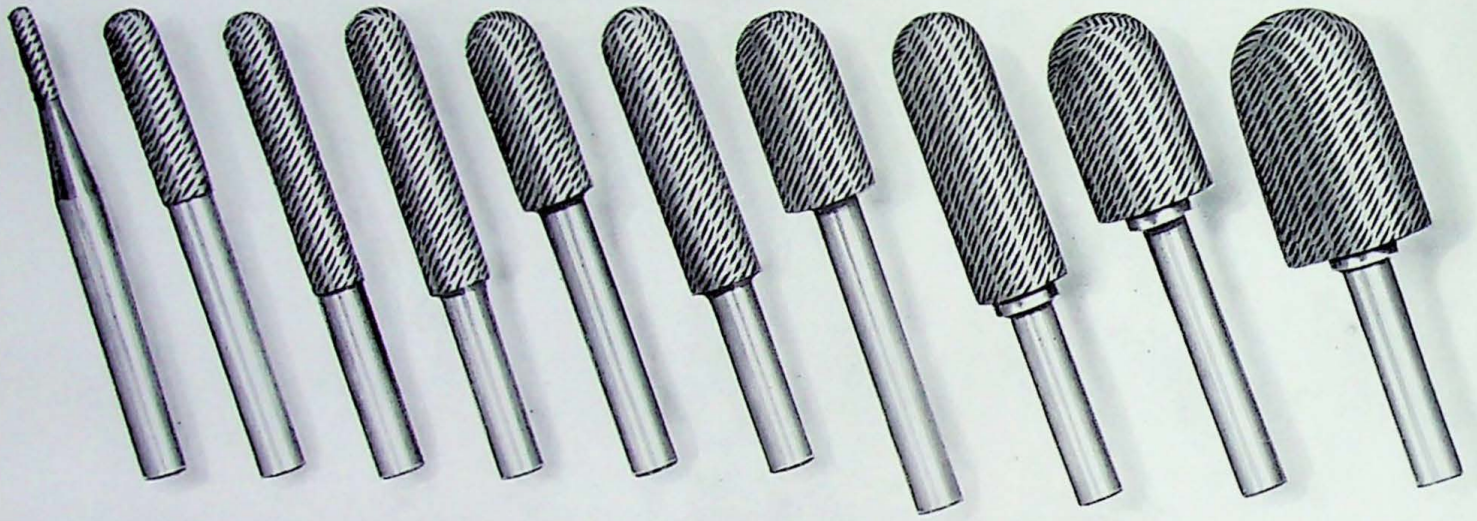
All regularly furnished with uncut ends but can be supplied with cut end at small additional charge.

NICHOLSON HAND CUT ROTARY FILES AND GROUND FROM SOLID BURS — WITH 1/4" SHANKS

CYLINDRICAL SHAPE RADIUS END

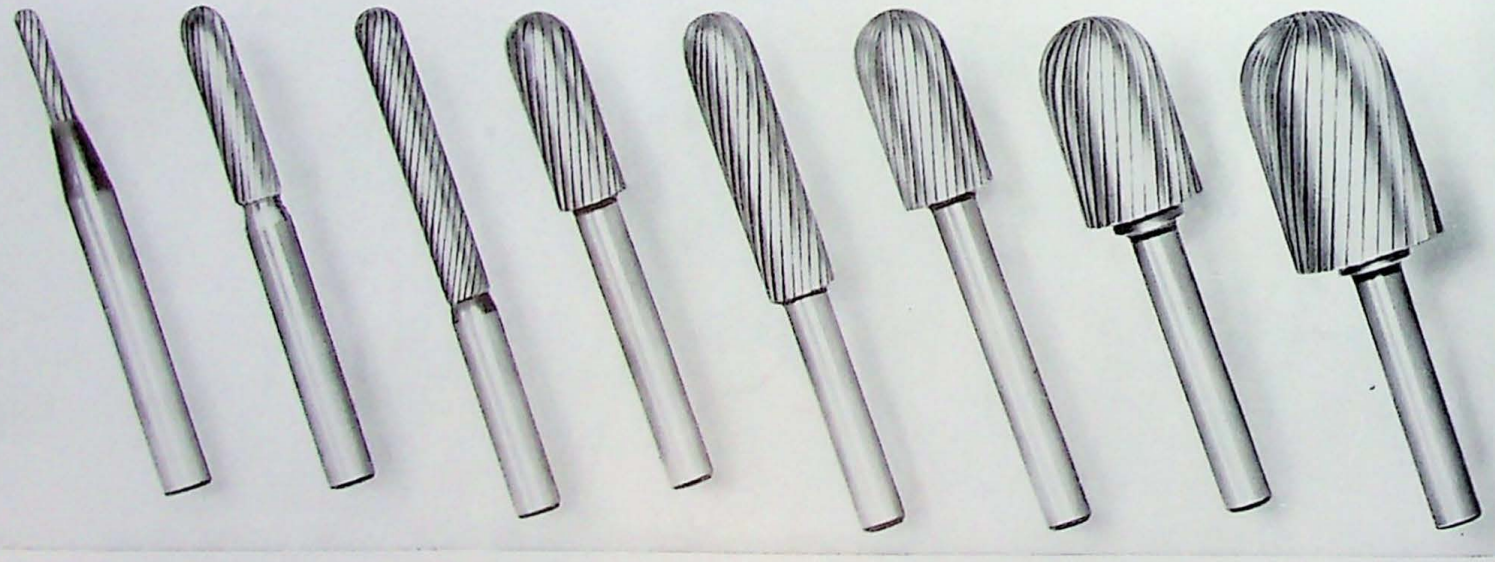
Made of Hi-Speed Steel

Stocked in Coarse, Medium and Fine Cuts



HAND CUT STYLE "B"

Number→	B 1 G	B 3 P	B 3 U	B 4 U	B 5 P	B 5 U	B 7 P	B 7 U	B 9 P	B 10 R
Diameter by Length	1/8 x 1/2	1/4 x 1	1/4 x 1 1/2	5/16 x 1 1/2	3/8 x 1	3/8 x 1 1/2	1/2 x 1	1/2 x 1 1/2	5/8 x 1	3/4 x 1 1/4



GROUND BUR STYLE "P"

Number→	P 1 G	P 3 P	P 3 U	P 5 P	P 5 U	P 7 P	P 9 P	P 10 R
Diameter by Length	1/8 x 1/2	1/4 x 1	1/4 x 1 1/2	3/8 x 1	3/8 x 1 1/2	1/2 x 1	5/8 x 1	3/4 x 1 1/4

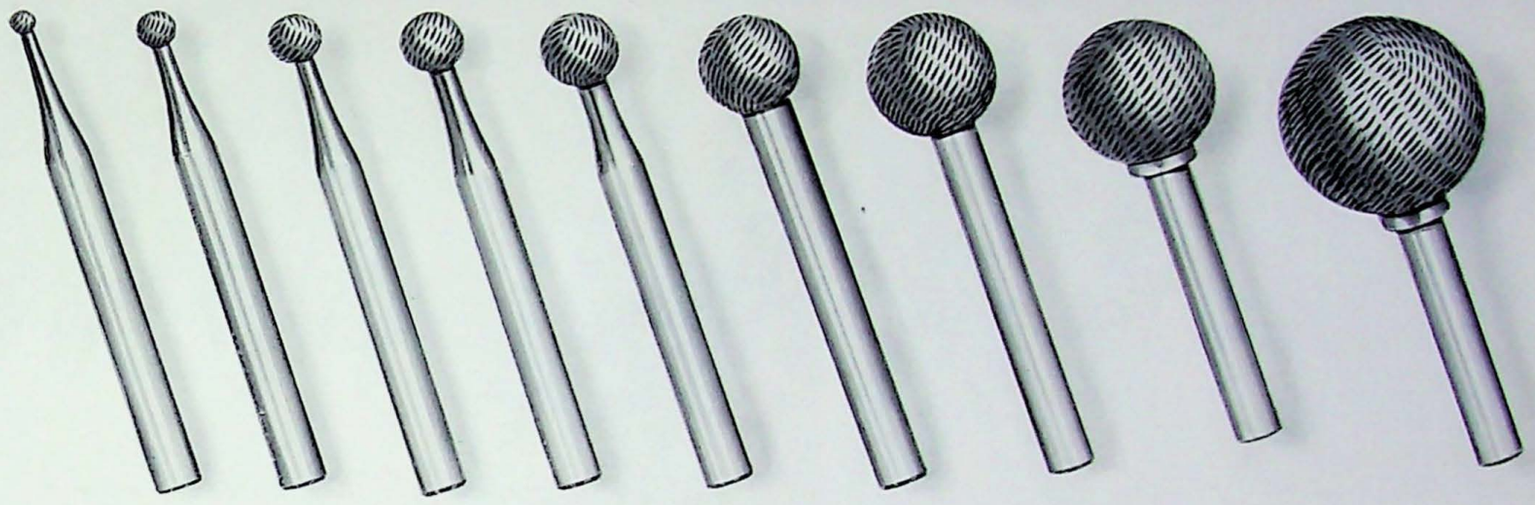
See Page 18 for Available Sets

NICHOLSON HAND CUT ROTARY FILES AND GROUND FROM SOLID BURS — WITH 1/4" SHANKS

BALL SHAPE

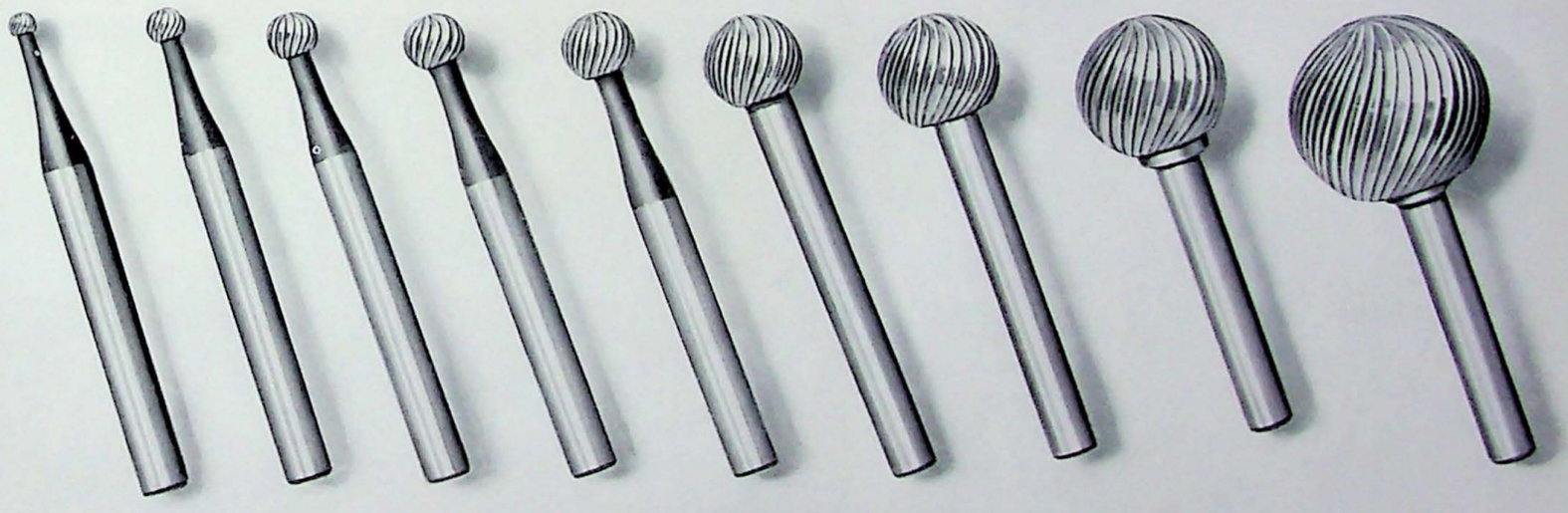
Made of Hi-Speed Steel

Stocked in Coarse, Medium and Fine Cuts



HAND CUT STYLE "C"

Number→	C 1	C 2	C 3	C 4	C 5	C 7	C 9	C 10	C 14
Diameter Inches	1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1



GROUND BUR STYLE "Q"

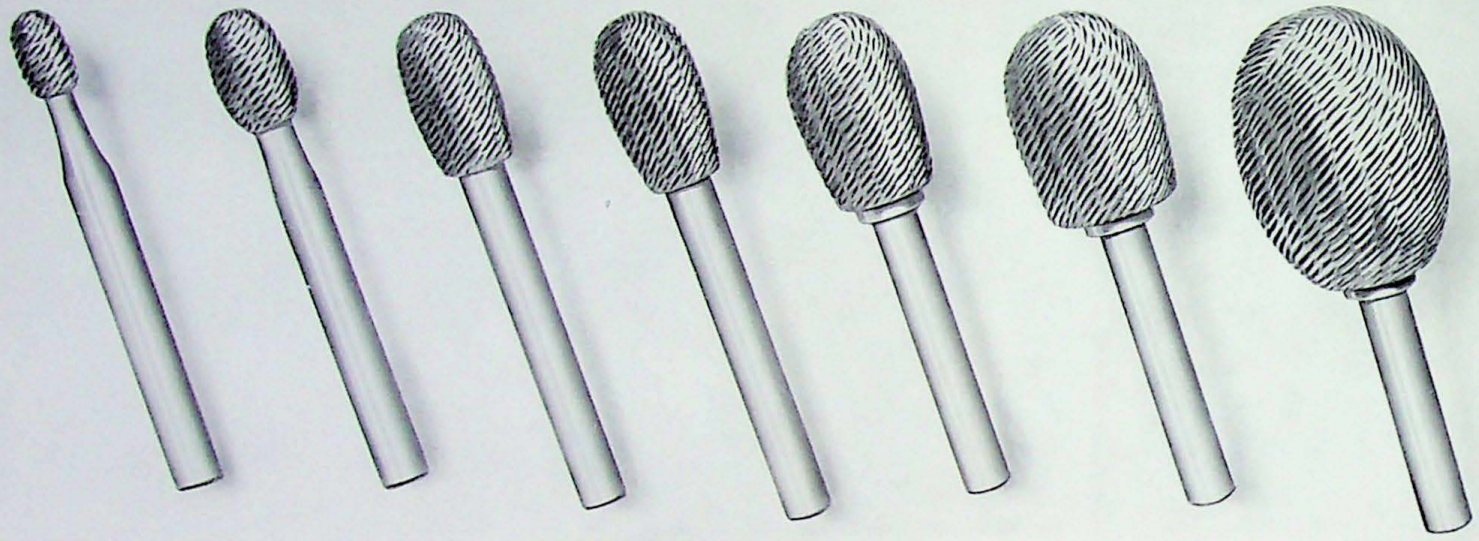
Number→	Q 1	Q 2	Q 3	Q 4	Q 5	Q 7	Q 9	Q 10	Q 14
Diameter Inches	1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1

NICHOLSON HAND CUT ROTARY FILES AND GROUND FROM SOLID BURS — WITH 1/4" SHANKS

OVAL SHAPE

Made of Hi-Speed Steel

Stocked in Coarse, Medium and Fine Cuts



HAND CUT STYLE "D"

Number→	D 3 G	D 5 K	D 6 L	D 7 M	D 9 N	D 10 P	D 14 S
Diameter by Length	1/4 x 1/2	3/8 x 3/4	7/16 x 13/16	1/2 x 7/8	5/8 x 15/16	3/4 x 1	1 x 1 3/8

GROUND BUR STYLE "R"

Number→	R 3 G	R 5 K	R 6 L	R 7 M	R 9 N	R 10 P	R 14 S
Diameter by Length	1/4 x 1/2	3/8 x 3/4	7/16 x 13/16	1/2 x 7/8	5/8 x 15/16	3/4 x 1	1 x 1 3/8

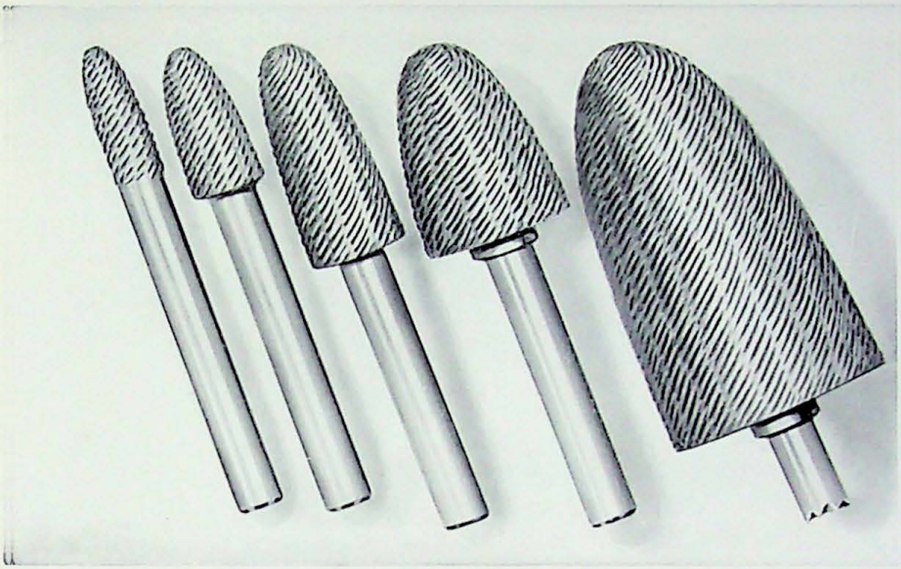
See Page 18 for Available Sets

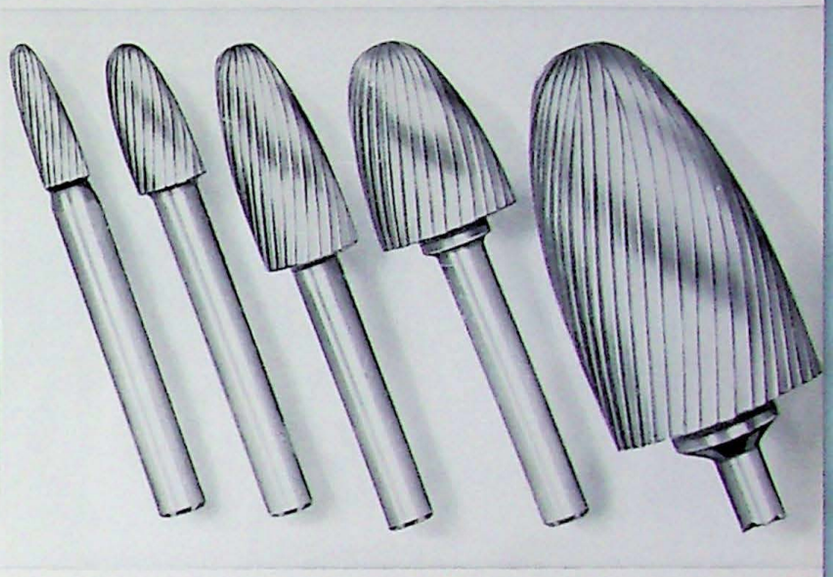
NICHOLSON HAND CUT ROTARY FILES AND GROUND FROM SOLID BURS — WITH 1/4" SHANKS

TREE SHAPE RADIUS END

Made of Hi-Speed Steel

Stocked in Coarse, Medium and Fine Cuts





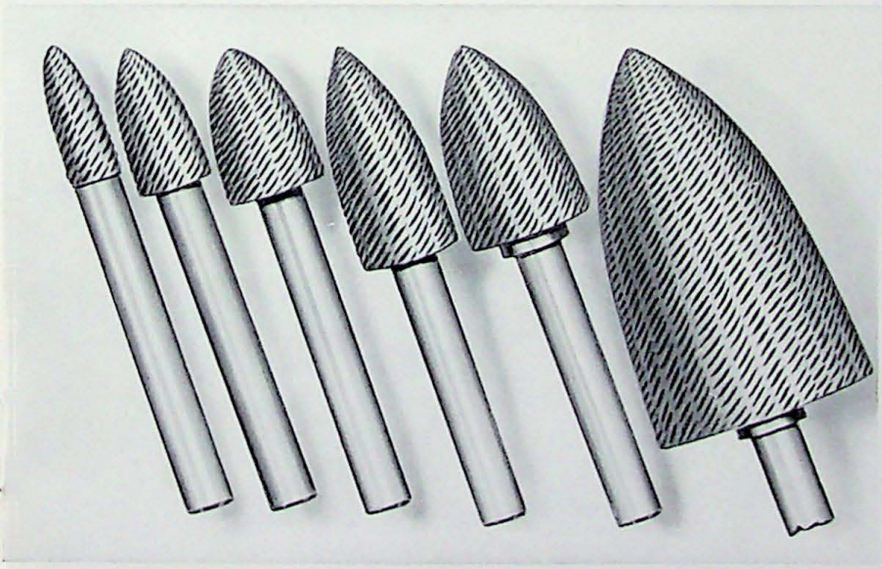
HAND CUT STYLE "E"

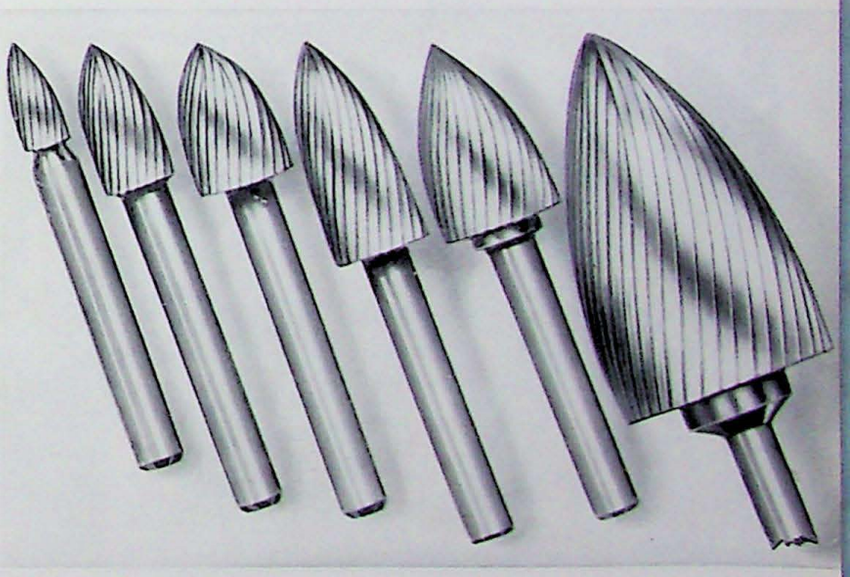
Number→	E 3 K	E 5 K	E 7 Q	E 10 P	E 15 Y
Diameter by Length	1/4 x 3/4	3/8 x 3/4	1/2 x 1 1/8	3/4 x 1	1 1/8 x 2

GROUND BUR STYLE "S"

	S 1 F	S 3 K	S 5 K	S 7 Q	S 10 P	S 15 Y
Diameter by Length	1/8 x 7/16	1/4 x 3/4	3/8 x 3/4	1/2 x 1 1/8	3/4 x 1	1 1/8 x 2

TREE SHAPE POINTED END





HAND CUT STYLE "F"

Number→	F 3 G	F 5 K	F 7 K	F 7 Q	F 9 P	F 15 Y
Diameter by Length	1/4 x 1/2	3/8 x 3/4	1/2 x 3/4	1/2 x 1 1/8	5/8 x 1	1 1/8 x 2

GROUND BUR STYLE "T"

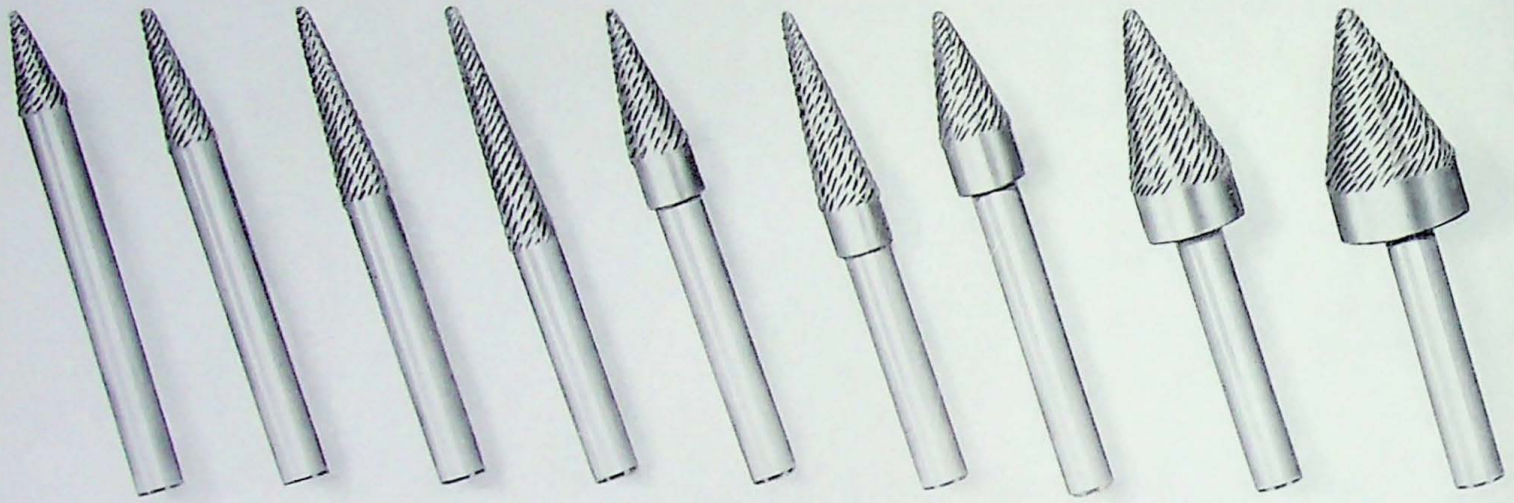
	T 3 G	T 5 K	T 7 K	T 7 Q	T 9 P	T 15 Y
Diameter by Length	1/4 x 1/2	3/8 x 3/4	1/2 x 3/4	1/2 x 1 1/8	5/8 x 1	1 1/8 x 2

NICHOLSON HAND CUT ROTARY FILES AND GROUND FROM SOLID BURS — WITH 1/4" SHANKS

CONE SHAPE

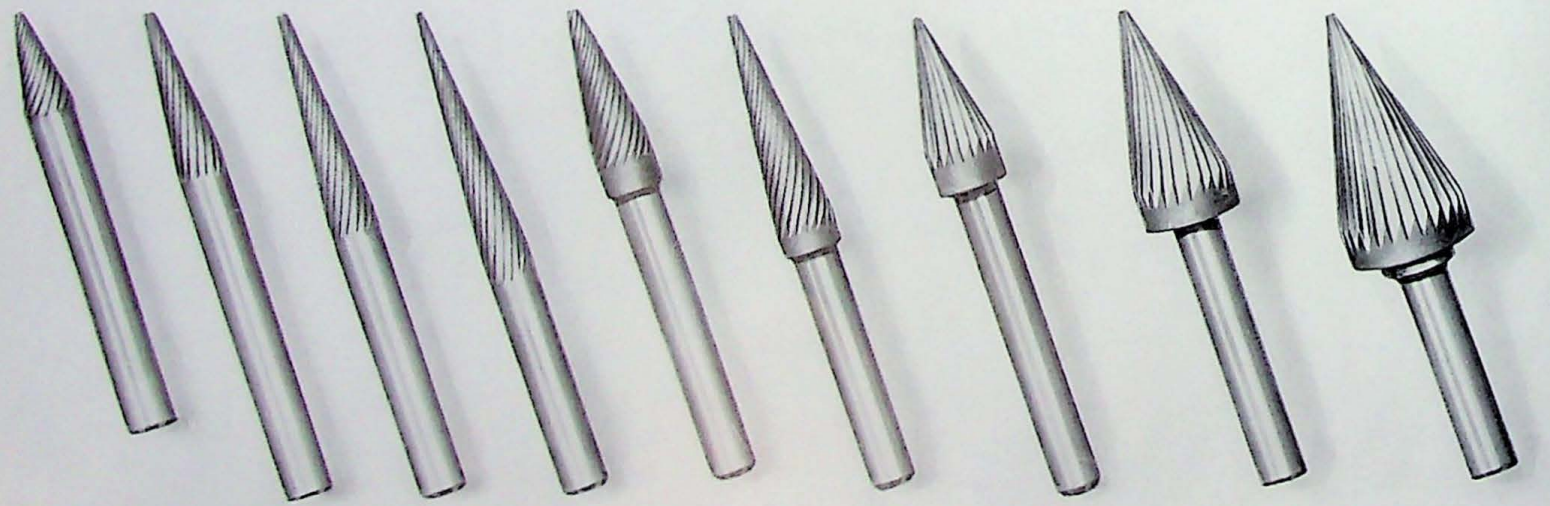
Made of Hi-Speed Steel

Stocked in Coarse, Medium and Fine Cuts



HAND CUT STYLE "G"

Number→	G 3 G	G 3 K	G 3 P	G 3 R	G 4 K	G 4 P	G 5 J	G 7 M	G 9 P
Dia. by Length	1/4 x 1/2	1/4 x 3/4	1/4 x 1	1/4 x 1 1/4	5/16 x 3/4	5/16 x 1	3/8 x 5/8	1/2 x 7/8	5/8 x 1
Included Angle	22°	14°	11°	8°	19°	14°	28°	28°	32°



GROUND BUR STYLE "U"

Number →	U 3 G	U 3 K	U 3 P	U 3 R	U 4 K	U 4 P	U 5 J	U 7 M	U 9 P
Dia. by Length	1/4 x 1/2	1/4 x 3/4	1/4 x 1	1/4 x 1 1/4	5/16 x 3/4	5/16 x 1	3/8 x 5/8	1/2 x 7/8	5/8 x 1
Included Angle	22°	14°	11°	8°	19°	14°	28°	28°	32°

See Page 18 for Available Sets

NICHOLSON HAND CUT ROTARY FILES AND GROUND FROM SOLID BURS — WITH 1/4" SHANKS

CONE SHAPE 60° INCLUDED ANGLE

Made of Hi-Speed Steel

Stocked in Coarse, Medium and Fine Cuts

HAND CUT STYLE "H"

Number→	H 5	H 7	H 9	H 10	H 14
Dia. Inches	3/8	1/2	5/8	3/4	1
Included Angle	60°	60°	60°	60°	60°

GROUND BUR STYLE "V"

	V 5	V 7	V 9	V 10	V 14
	3/8	1/2	5/8	3/4	1
	60°	60°	60°	60°	60°

CONE SHAPE 90° INCLUDED ANGLE

HAND CUT STYLE "J"

Number→	J 5	J 7	J 9	J 10	J 14
Dia. Inches	3/8	1/2	5/8	3/4	1
Included Angle	90°	90°	90°	90°	90°

GROUND BUR STYLE "W"

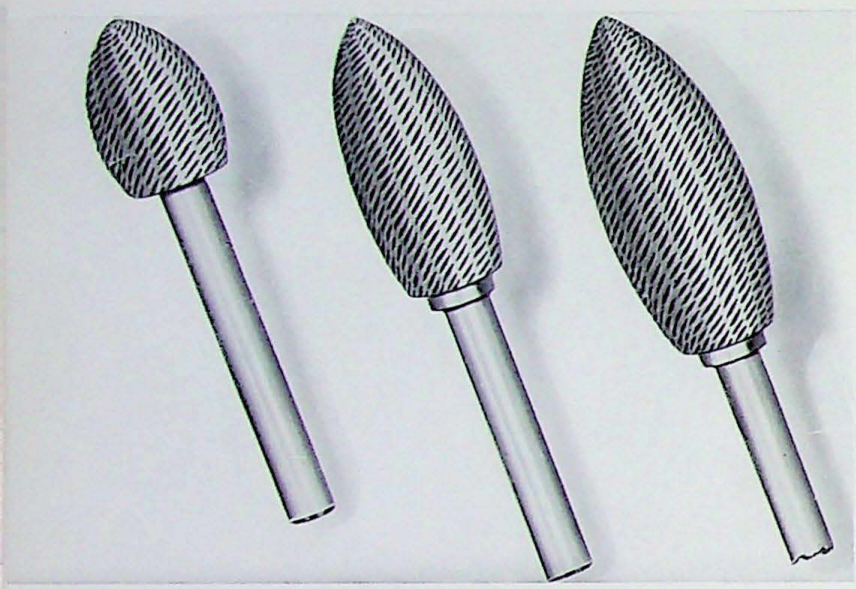
	W 5	W 7	W 9	W 10	W 14
	3/8	1/2	5/8	3/4	1
	90°	90°	90°	90°	90°

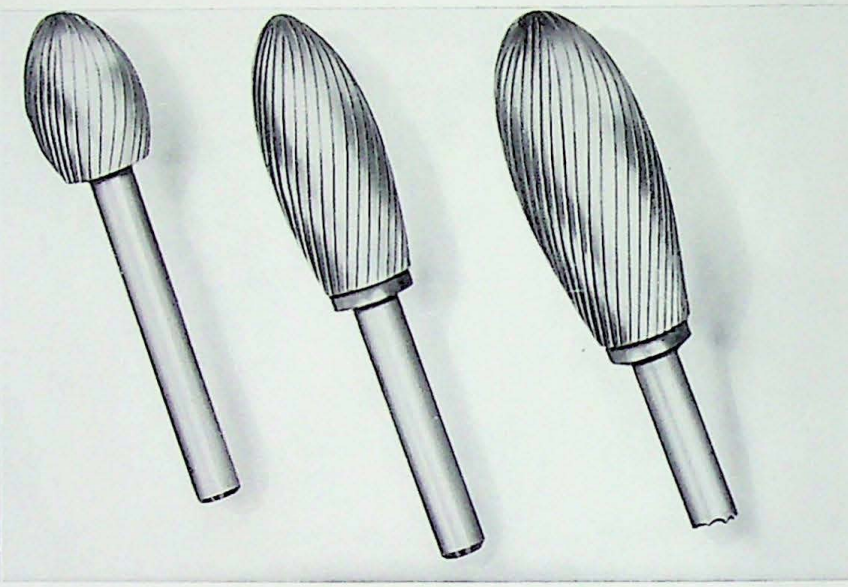
NICHOLSON HAND CUT ROTARY FILES AND GROUND FROM SOLID BURS — WITH 1/4" SHANKS

FLAME SHAPE

Made of Hi-Speed Steel

Stocked in Coarse, Medium and Fine Cuts





	HAND CUT STYLE "K"			GROUND BUR STYLE "X"		
Number→	K 9 M	K 9 T	K 10 W	X 9 M	X 9 T	X 10 W
Diameter by Length	5/8 x 7/8	5/8 x 1 7/16	3/4 x 1 3/4	5/8 x 7/8	5/8 x 1 7/16	3/4 x 1 3/4

BI-SHAPE

	HAND CUT STYLE "L"			GROUND BUR STYLE "Y"		
Number→	L 3 P	L 4 Q	L 5 Q (Ball Nose)	Y 3 P	Y 4 Q	Y 5 Q (Ball Nose)
Diameter by Length	1/4 x 1	5/16 x 1 1/8	3/8 x 1 1/8	1/4 x 1	5/16 x 1 1/8	3/8 x 1 1/8

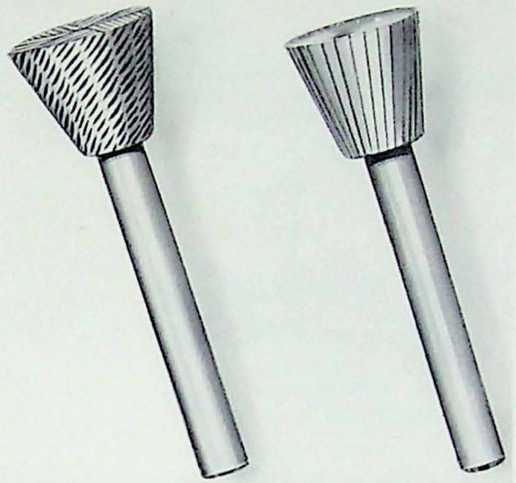
See Page 18 for Available Sets

NICHOLSON HAND CUT ROTARY FILES AND GROUND FROM SOLID BURS — WITH 1/4" SHANKS

Made of Hi-Speed Steel

Stocked in Coarse, Medium and Fine Cuts

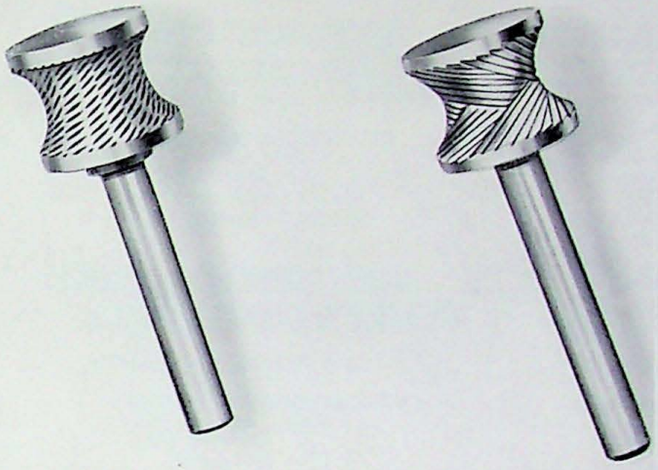
INVERTED CONE SHAPE



	HAND CUT STYLE "M"	GROUND BUR STYLE "Z"
Number →	M 10 J	Z 10 J*
Dia. by Length	3/4 x 5/8	3/4 x 5/8

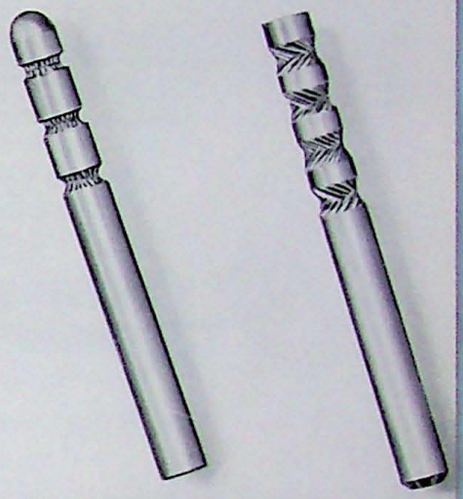
*Note: Can be furnished with cut end at small additional charge.

CONCAVE SHAPE TYPE I



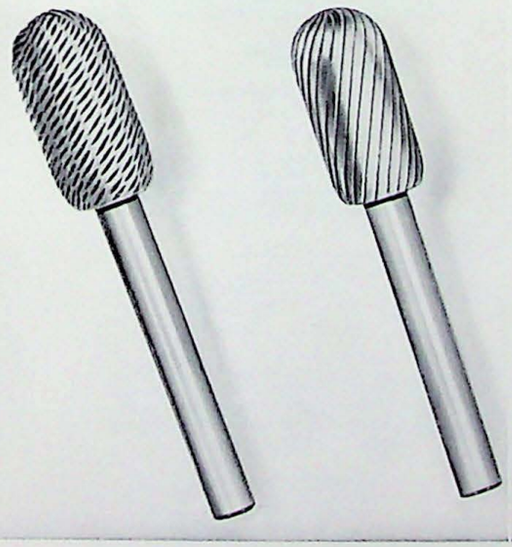
	HAND CUT STYLE "AA"	GROUND BUR STYLE "NN"
Number →	AA 10 J	NN 10 J
Dia. by Length	3/4 x 5/8	3/4 x 5/8

CONCAVE SHAPE TYPE II



	HAND CUT STYLE "BB"	GROUND BUR STYLE "PP"
Number →	BB 3	PP 3
Dia. by Length	1/4	1/4

BARREL SHAPE



	HAND CUT STYLE "CC"	GROUND BUR STYLE "QQ"
Number →	CC 7 P	QQ 7 P
Dia. by Length	1/2 x 1	1/2 x 1

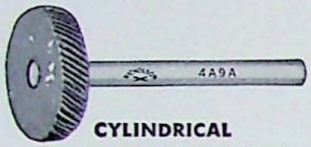
CYL. SHAPE DOUBLE TAPER

	HAND CUT STYLE "DD"	GROUND BUR STYLE "RR"
Number →	DD 15 E	RR 15 E
Dia. by Length	1 1/8 x 3/8	1 1/8 x 3/8

Nicholson Rotary Power Files are made with the same care and craftsmanship which have made Nicholson Hand Files and Rasps known the world over for uniformly high quality.

HAND CUT ROTARY FILES
1/8" SHANKS
Made of Hi-Speed Steel

Here is a complete assortment of Nicholson Hand Cut Rotary Files with 1/8" shanks; beautiful little tools of High Speed Steel for use by tool, die, pattern, jewelry, dental and optical shops or by anyone else who does power filing on relatively delicate operations. These files may be used with portable hand tools (electric or air), drill press or flexible shaft. See table on page 5 for recommended speeds.



CYLINDRICAL FLAT END AND EDGE

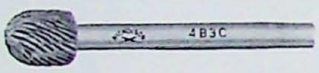
No.	Diameter by Length
4A9A	5/8 x 1/8

CYLINDRICAL FLAT END

No.	Diameter by Length
4A3G	1/4 x 1/2

CYLINDRICAL FLAT END

No.	Diameter by Length
4A1J	1/8 x 5/8

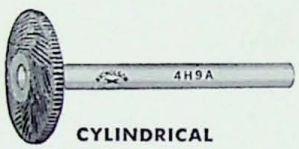


CYLINDRICAL RADIUS END

No.	Diameter by Length
4B3C	1/4 x 1/4

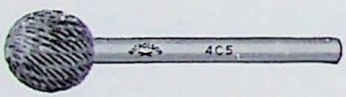
CYLINDRICAL RADIUS END

No.	Diameter by Length
4B1J	1/8 x 5/8



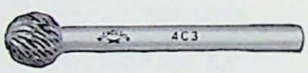
CYLINDRICAL RADIUS END AND EDGE

No.	Diameter by Length
4H9A	5/8 x 1/8



BALL

No.	Diameter
4C5	3/8

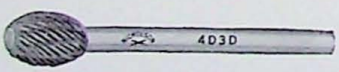


BALL

No.	Diameter
4C3	1/4

OVAL

No.	Diameter by Length
4D3G	1/4 x 1/2



OVAL

No.	Diameter by Length
4D3D	1/4 x 5/16

TREE POINTED END

No.	Diameter by Length
4F3G	1/4 x 1/2

CONE

No.	Diameter by Length
4G3G	1/4 x 1/2

CONE 60°

No.	Diameter by Length
4G3C	1/4 x 1/4

CONE

No.	Diameter by Length
4G1H	1/8 x 9/16

CONE

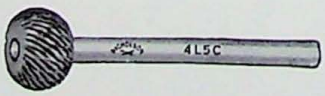
No.	Diameter by Length
4G1C	1/8 x 1/4

CONE 60°

No.	Diameter by Length
4G5E	3/8 x 3/8

FLAME

No.	Diameter by Length
4K3G	1/4 x 1/2



FLAT TOP BALL

No.	Diameter by Length
4L5C	3/8 x 1/4

Corresponding shapes of Ground from Solid Burs shown on page 17

MADE IN ONE COARSENESS OF CUT ONLY

GROUND BURS
1/8" SHANKS
Made of Hi-Speed Steel

Nicholson Ground Burs with 1/8" shanks are used principally on the nonferrous metals in contrast to the group of Hand Cut Rotary Files which are used on ferrous metals. Ground Burs with 1/8" shanks may be used with portable hand tools (electric or air), drill press or flexible shaft. See table on page 5 for recommended speeds.

CYLINDRICAL FLAT END AND EDGE

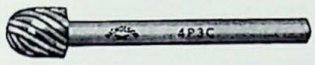
No.	Diameter by Length
4N9A	5/8 x 1/8

CYLINDRICAL FLAT END

No.	Diameter by Length
4N3G	1/4 x 1/2

CYLINDRICAL FLAT END

No.	Diameter by Length
4N1J	1/8 x 5/8

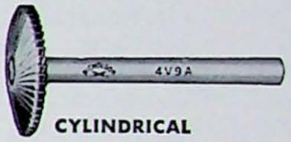


CYLINDRICAL RADIUS END

No.	Diameter by Length
4P3C	1/4 x 1/4

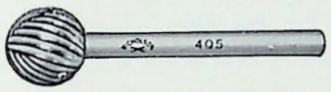
CYLINDRICAL RADIUS END

No.	Diameter by Length
4P1J	1/8 x 5/8



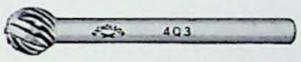
CYLINDRICAL RADIUS END AND EDGE

No.	Diameter by Length
4V9A	5/8 x 1/8



BALL

No.	Diameter
4Q5	3/8

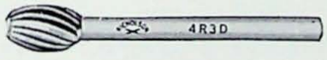


BALL

No.	Diameter
4Q3	1/4

OVAL

No.	Diameter by Length
4R3G	1/4 x 1/2



OVAL

No.	Diameter by Length
4R3D	1/4 x 5/16

TREE POINTED END

No.	Diameter by Length
4T3G	1/4 x 1/2

CONE

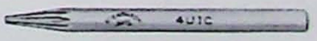
No	Diameter by Length
4U3G	1/4 x 1/2

CONE 60°

No.	Diameter by Length
4U3C	1/4 x 1/4

CONE

No.	Diameter by Length
4U1H	1/8 x 9/16



CONE

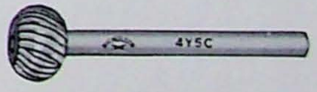
No.	Diameter by Length
4U1C	1/8 x 1/4

CONE 60°

No.	Diameter by Length
4U5E	3/8 x 3/8

FLAME

No.	Diameter by Length
4X3G	1/4 x 1/2



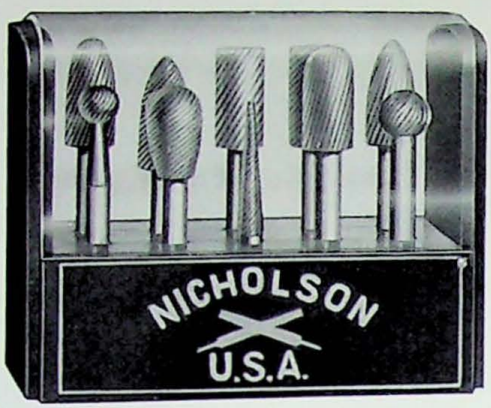
FLAT TOP BALL

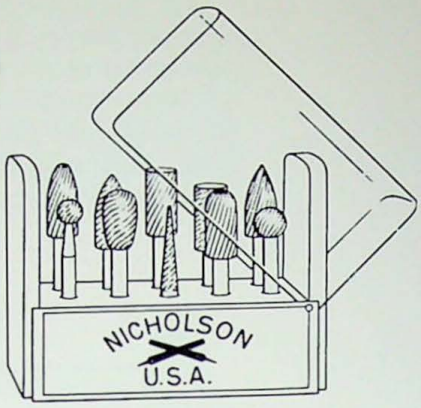
No.	Diameter by Length
4Y5C	3/8 x 1/4

MADE IN ONE COARSENESS OF CUT ONLY

3 POPULAR ASSORTMENTS 1/4" SHANK ROTARY FILES AND GROUND BURS

Made of Hi-Speed Steel





ROTAKIT

Pride of the Industrial and Home Craftsman

With Rotary Files and Ground Burs becoming more and more popular among high grade machinists, the Rotakit will win instant approval from everyone who wants his valuable tools well protected when he is not using them; and immediately accessible for instant use.

The Rotakit is the new and logical method of packaging Rotary Files and Ground Burs. It serves as a handy bench stand. It has a solid plastic hinge cover which permits the quick selection of a desired file or bur.

The Rotakit comes in three popular assortments. No. 20 contains 10 assorted Nicholson Ground Burs. No. 30 contains 10 assorted Nicholson Hand Cut Rotary Files. No. 40 contains 5 Nicholson assorted Ground Burs and 5 assorted Nicholson Hand Cut Rotary Files.

There is no charge for this handsome container.

NO. 20 ROTAKIT
10 GROUND BURS
Medium Cut

Code		Code	
N 7 P	Q 7	A 3 P	D 7 M
P 3 P	R 5 K	A 7 P	F 7 Q
P 7 P	R 7 M	A 10 K	G 3 R
Q 3	S 7 Q	C 3	L 3 P
Q 5	T 7 Q	C 5	M 10 J

NO. 30 ROTAKIT
10 ROTARY FILES
Medium Cut

NO. 40 ROTAKIT
5 GROUND BURS AND 5 ROTARY FILES
Medium Cut

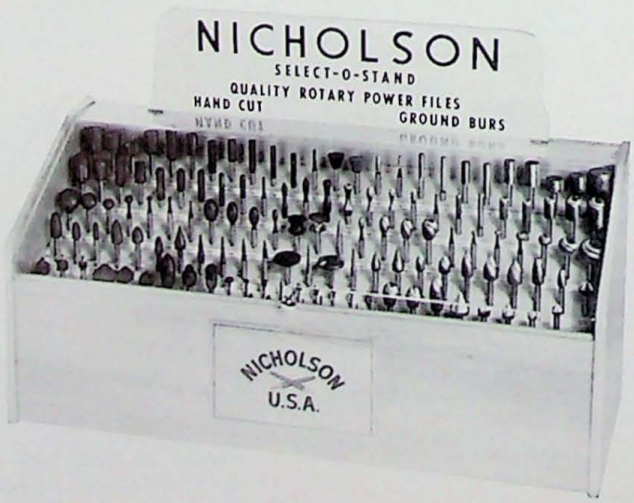
Code	Code
N 7 P	A 7 P
P 7 P	C 5
Q 7	D 7 M
S 7 Q	G 3 R
T 7 Q	F 7 Q

NO. 52 ROTASTAND

This display, finished in Blue and Orange lacquer, has 22 Hand Cut Rotary Files and 21 Ground from Solid Burs with 1/4" Shanks as well as 9 of our most popular 1/8" Shank tools which are easily identified by their code numbers on the panel.

NO. 135 SELECT-O-STAND

This display, made of solid basswood in a beautiful natural finish, has 59 Hand Cut Rotary Files and 58 Ground from Solid Burs with 1/4" Shanks as well as 18 of our most popular 1/8" Shank tools which are easily identified by their code numbers on the panel.



5 DIFFERENT ASSORTMENTS 1/8" SHANK ROTARY FILES AND GROUND BURS

Made of Hi-Speed Steel

ROTASETS

Rotasets to Meet Every Need

Designed to bring 1/8" shank Rotary Files and Burs to the user in compact and useful packages, Rotasets act as handy bench stands for the tools while the operator is working and protects them from dust and moisture when the operator puts them away. There are five different assortments as shown on this page. Individual items may be replaced by referring to code numbers. Regular prices. (No charge for package.)

ROTASET NO. 88 (18 Ground Burs)

Code	Code	Code
4N 1 J	4Q 5	4U 3 C
4N 3 G	4R 3 D	4U 3 G
4N 9 A	4R 3 G	4U 5 E
4P 1 J	4T 3 G	4V 9 A
4P 3 C	4U 1 C	4X 3 G
4Q 3	4U 1 H	4Y 5 C

ROTASET NO. 99 (18 Hand Cut Rotary Files)

Code	Code	Code
4A 1 J	4C 5	4G 3 C
4A 3 G	4D 3 D	4G 3 G
4A 9 A	4D 3 G	4G 5 E
4B 1 J	4F 3 G	4H 9 A
4B 3 C	4G 1 C	4K 3 G
4C 3	4G 1 H	4L 5 C

ROTASET NO. 77 (9 Ground Burs and 9 Rotary Files)

GROUND BURS	ROTARY FILES
Code	Code
4T 3 G	4F 3 G
4R 3 G	4D 3 G
4Q 5	4C 5
4U 1 H	4G 1 H
4X 3 G	4K 3 G
4N 3 G	4A 3 G
4P 1 J	4B 1 J
4V 9 A	4H 9 A
4Y 5 C	4L 5 C

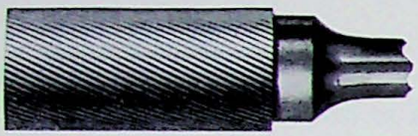
ROTASET NO. 55 (8 Ground Burs)

Code
4T 3 G
4R 3 G
4Q 5
4U 1 H
4X 3 G
4N 3 G
4P 1 J
4V 9 A

ROTASET NO. 66 (8 Rotary Files)

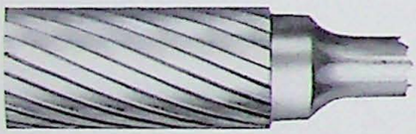
Code
4F 3 G
4D 3 G
4C 5
4G 1 H
4K 3 G
4A 3 G
4B 1 J
4H 9 A

TUNGSTEN CARBIDE BURS



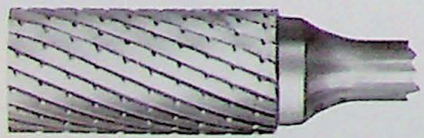
FINE CUT

MEDIUM CUT



COARSE CUT

DIAMOND CUT



CHIP BREAKER

These Nicholson Carbide Burs are manufactured in our plant at Providence, Rhode Island. They are precision ground from tungsten carbide blanks. All our Carbide Burs which have ¼" diameter heads are made from solid carbide, which eliminates the possibility of the heads of these small tools snapping off at the braze.

Nicholson Carbide Burs can be reground many times at a small part of the original cost of the tool. Worn Carbide Burs should be shipped back to distributor for this resharpening service.

Nicholson Carbide Burs are available from stock in twenty styles, 184 sizes, and in Coarse, Standard or Medium and Fine Cuts. Other styles and cuts are available on special order.

RECOMMENDED SPEEDS ON PAGE 31

CARBIDE BUR FLUTING CHART

Diameter of Bur	Number of Flutes in Circumference		
	Coarse	Standard or Medium	Fine
1/16	8	14	20
3/32	10	18	24
1/8	12	20	28
3/16	14	24	34
1/4	15	27	42
5/16	16	30	48
3/8	18	32	52
7/16	18	34	54
1/2	20	36	56
5/8	22	38	60
3/4	24	40	64
7/8	25	42	68
1	27	44	72

NOTE:—Samples of various cuts shown

STANDARD Fluting will be supplied, unless otherwise specified.

COARSE and FINE cut Burs are also carried in stock for immediate delivery.

EXTRA COARSE cut Burs can be furnished upon request.

DIAMOND CUT can be supplied in Coarse, Standard or Medium and Fine Cuts upon request. 20% extra.

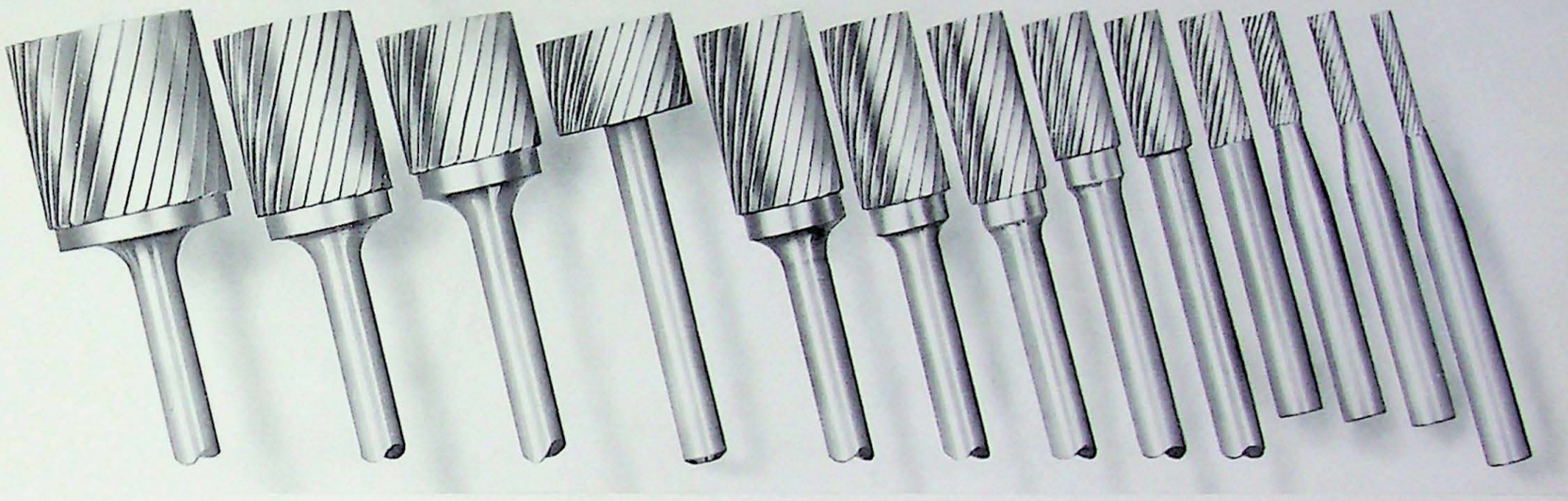
CHIP BREAKERS can also be supplied on any Burs upon request. No charge.

PLEASE BE SURE TO SPECIFY TYPE OF CUT REQUIRED, IF OTHER THAN STANDARD

CARBIDE BURS
1/4" SHANKS

Stocked in Coarse, Medium and Fine Cuts

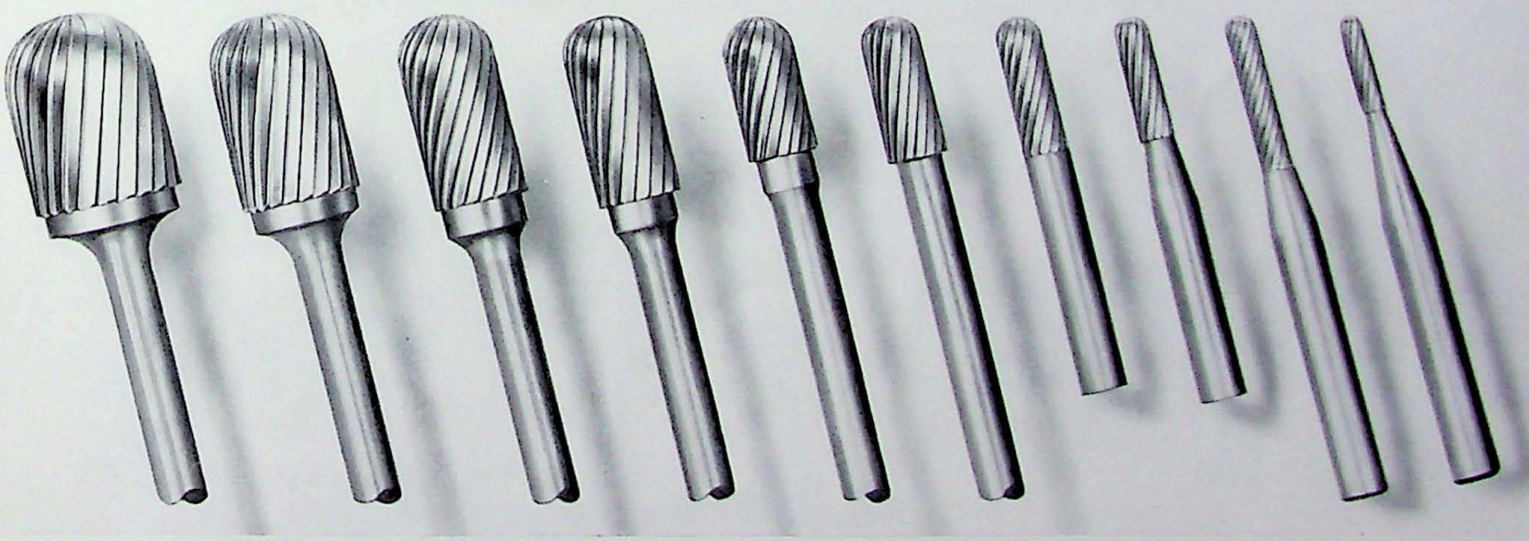
CYLINDRICAL FLAT END



Number →	N-100	N-750	N-751	N-752	N-625	N7PW	N-437	N5KW	N-312	N3JW	N-187	N-156	N-125
Diameter by Length	1 x 1	3/4 x 1	3/4 x 3/4	3/4 x 1/2	5/8 x 1	1/2 x 1	7/16 x 1	3/8 x 3/4	5/16 x 3/4	1/4 x 5/8	3/16 x 5/8	5/32 x 5/8	1/8 x 1/2

Can be furnished with cut end at small additional charge.

CYLINDRICAL RADIUS END

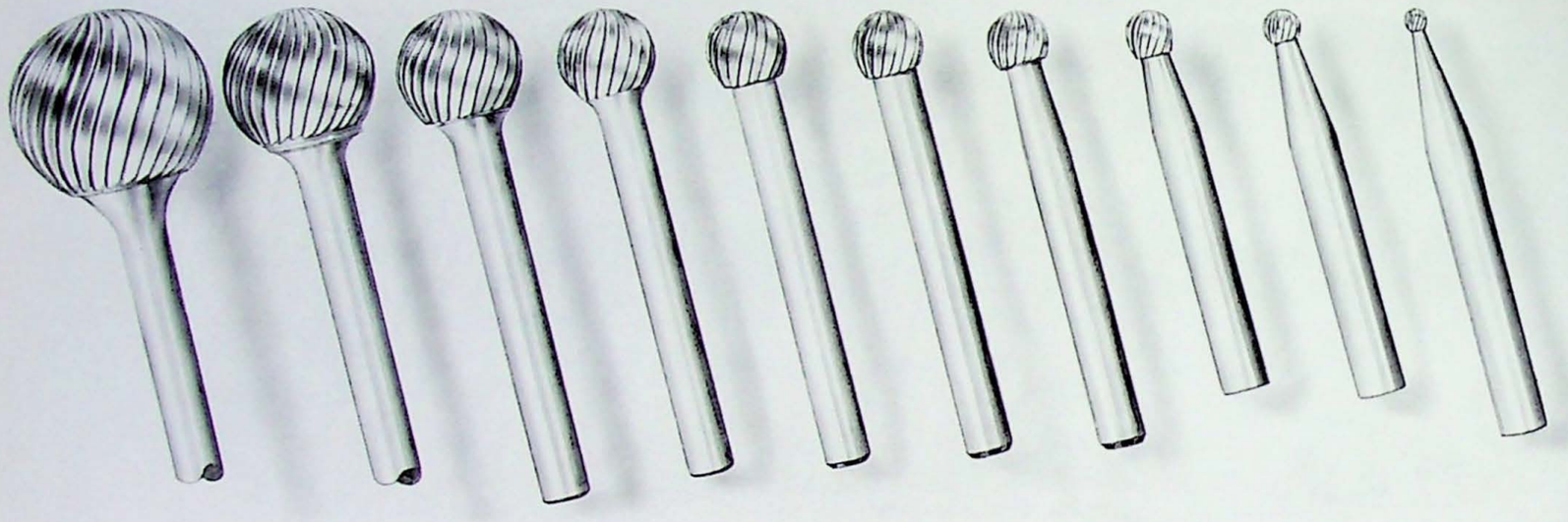


Number →	P-750	P9PW	P7PW	P-437	P5KW	P-312	P3JW	P-187	P-156	P-125
Diameter by Length	3/4 x 1	5/8 x 1	1/2 x 1	7/16 x 1	3/8 x 3/4	5/16 x 3/4	1/4 x 5/8	3/16 x 5/8	5/32 x 5/8	1/8 x 1/2

CARBIDE BURS
1/4" SHANKS

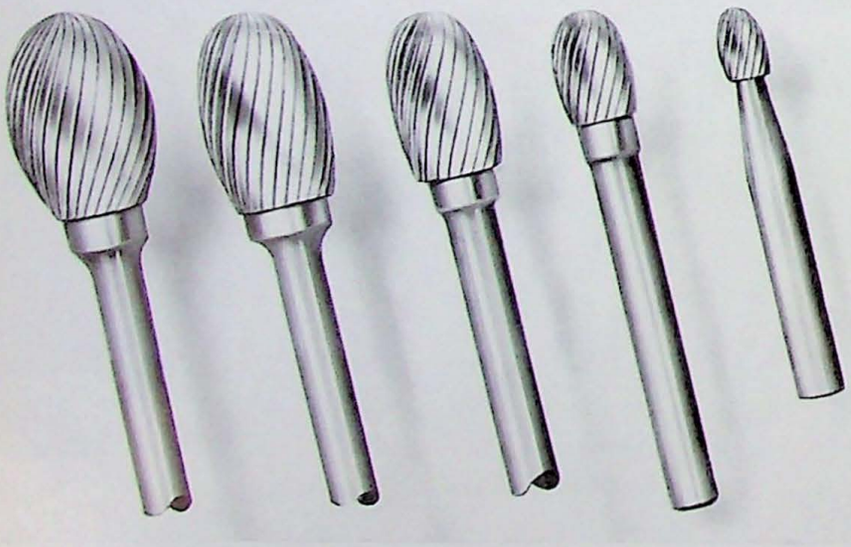
Stocked in Coarse, Standard and Fine Cuts

BALL SHAPE



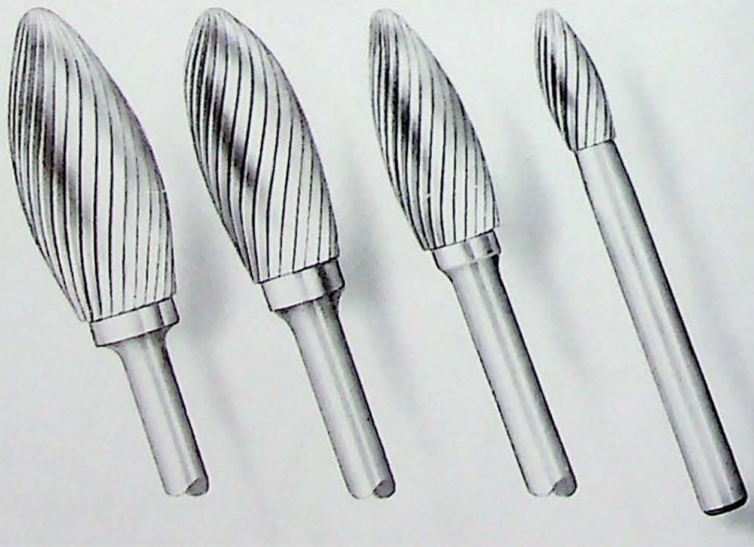
Number →	Q14W	Q10W	Q9W	Q7W	Q-437	Q5W	Q-312	Q3W	Q-187	O-125
Diameter	1	3/4	5/8	1/2	7/16	3/8	5/16	1/4	3/16	1/8

OVAL SHAPE



Number →	R-750	R9PW	R7MW	R-375	R-250
Diameter by Length	3/4 x 1	5/8 x 1	1/2 x 7/8	3/8 x 5/8	1/4 x 3/8

FLAME SHAPE

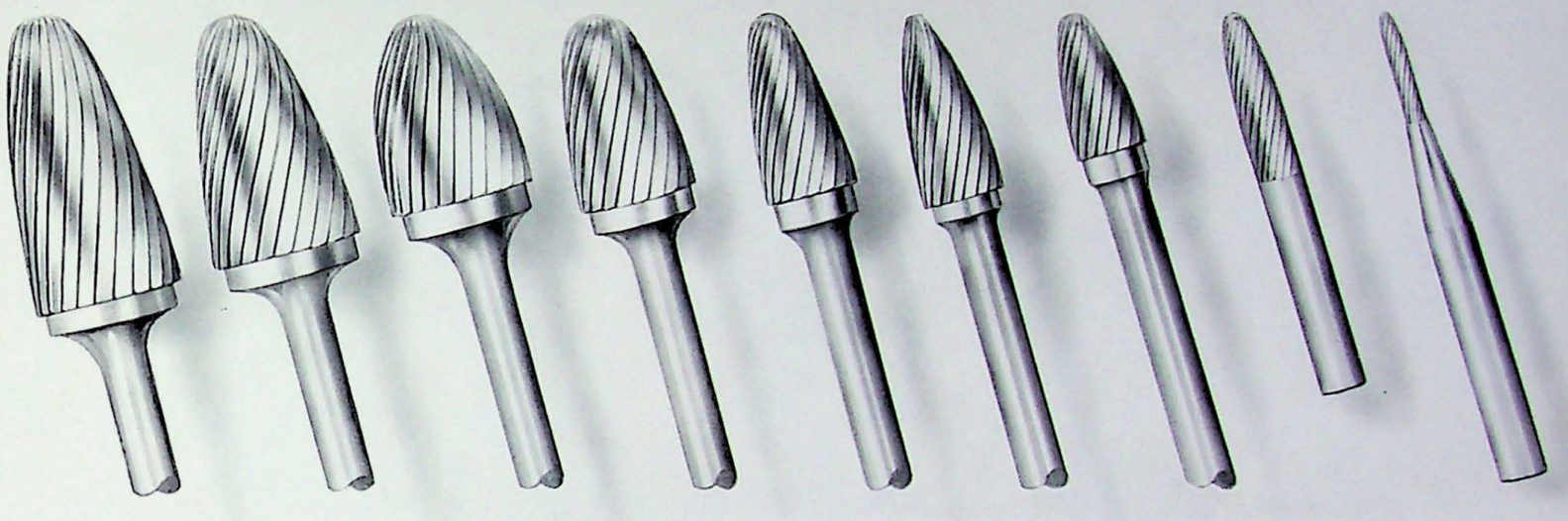


Number →	X-750	X-625	X-500	X-312
Diameter by Length	3/4 x 1 5/8	5/8 x 1 7/16	1/2 x 1 1/4	5/16 x 3/4

CARBIDE BURS
1/4" SHANKS

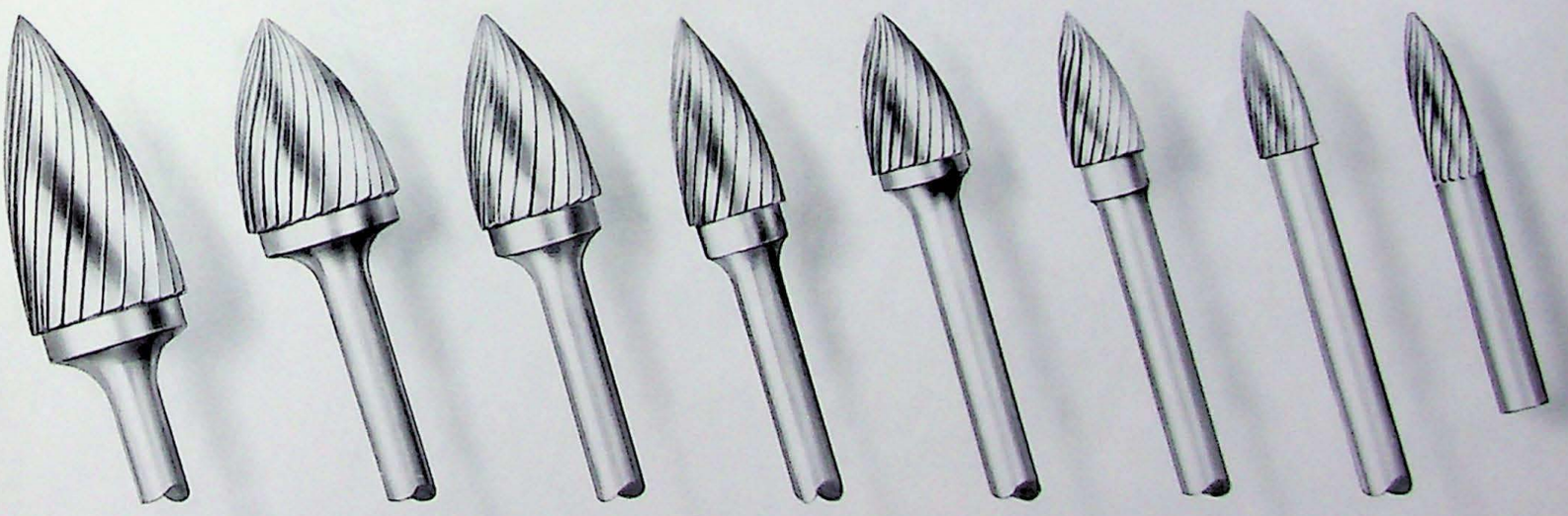
Stocked in Coarse, Standard and Fine Cuts

TREE SHAPE RADIUS END



Number →	S-750	S-751	S-752	S-625	S7PW	S7KW	S-437	S5KW	S3JW	S-125
Diameter by Length	3/4 x 1 1/2	3/4 x 1 1/4	3/4 x 1	5/8 x 1	1/2 x 1	1/2 x 3/4	7/16 x 1	3/8 x 3/4	1/4 x 5/8	1/8 x 1/2

TREE SHAPE POINTED END

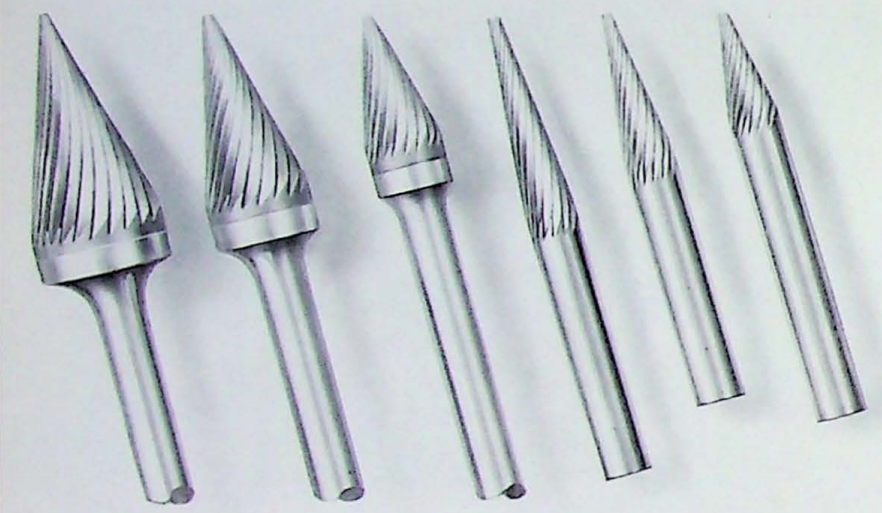


Number →	T-750	T-751	T-625	T-500	T7KW	T-375	T-312	T3JW
Diameter by Length	3/4 x 1 1/2	3/4 x 1	5/8 x 1	1/2 x 1	1/2 x 3/4	3/8 x 3/4	5/16 x 3/4	1/4 x 5/8

CARBIDE BURS
1/4" SHANKS

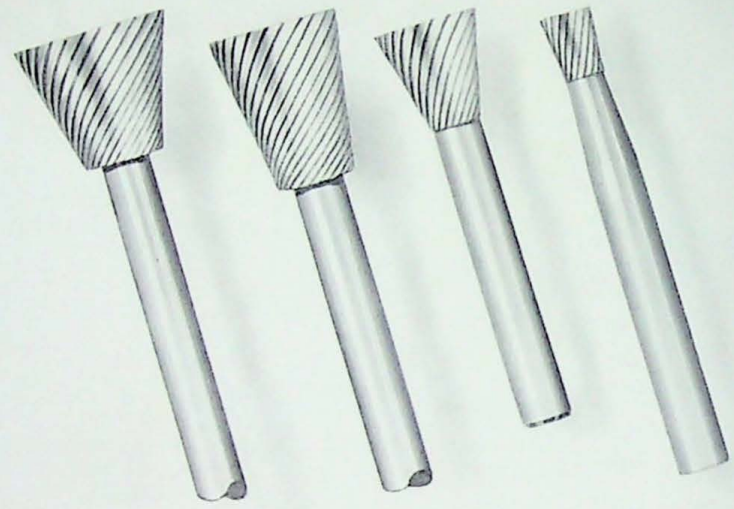
Stocked in Coarse, Standard and Fine Cuts

CONE SHAPE



Number →	U-625	U9MW	U-500	U-375	U-250	U3JW	U-252
Diameter by Length	5/8 x 1	5/8 x 7/8	1/2 x 7/8	3/8 x 5/8	1/4 x 1	1/4 x 3/4	1/4 x 1/2
Included Angle	31°	35°	28°	28°	10°	14°	22°

INVERTED CONE

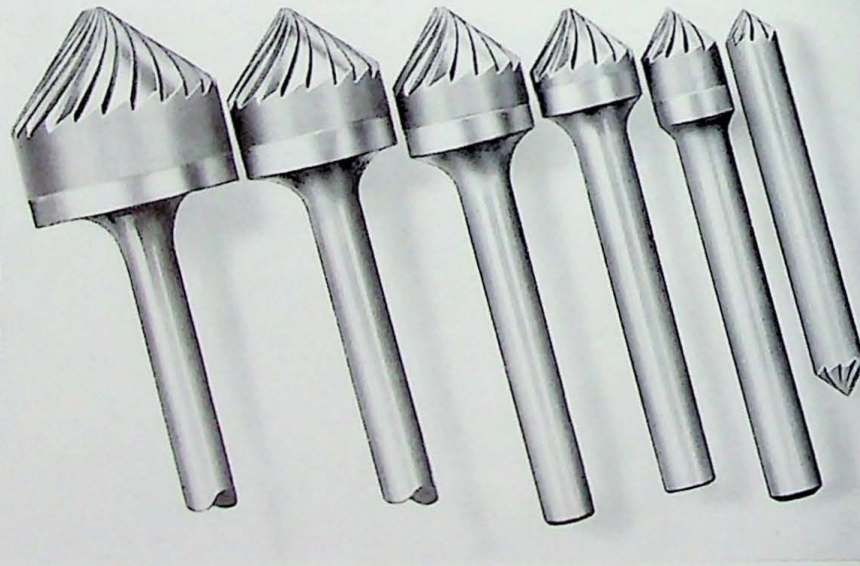


Number →	M-750	M-625	M-500	M-250
Diameter by Length	3/4 x 5/8	5/8 x 3/4	1/2 x 1/2	1/4 x 5/16
Included Angle	30°	18°	28°	10°

CONE SHAPE 60° INCLUDED ANGLE

Number →	V-100	V-12W	V-750	V-625	V7W	V-375	V-250
Diameter Inches	1	7/8	3/4	5/8	1/2	3/8	1/4
Included Angle	60°	60°	60°	60°	60°	60°	60°

CONE SHAPE 90° INCLUDED ANGLE

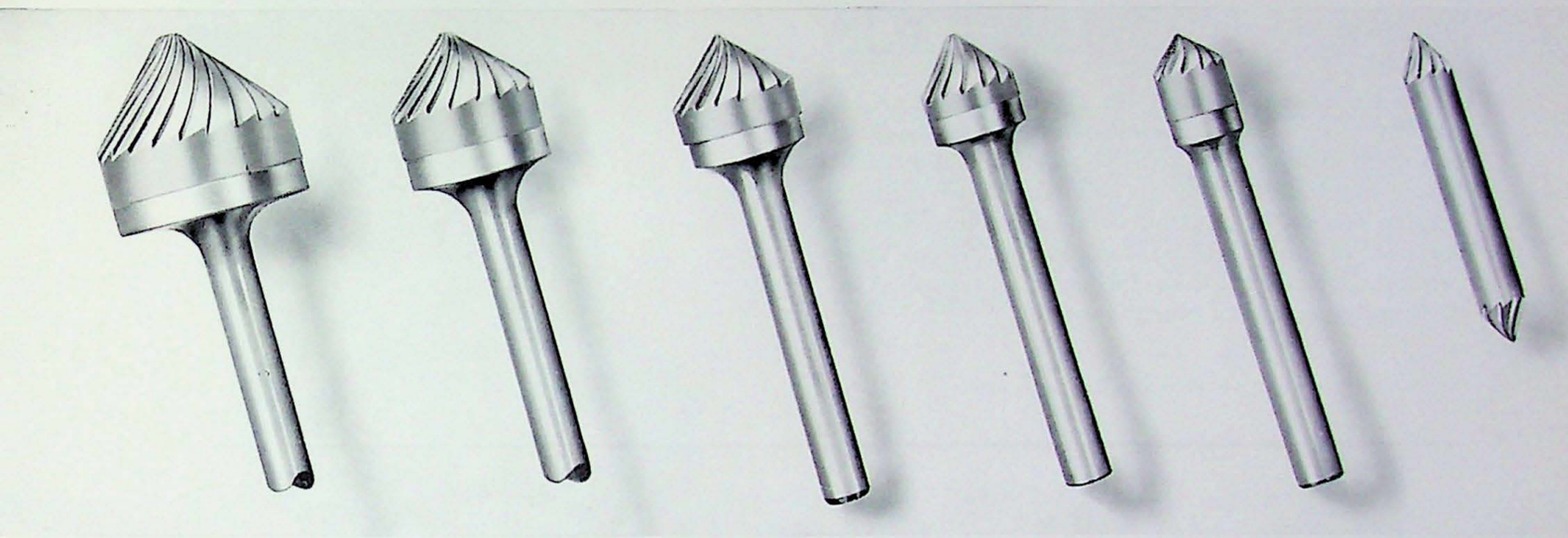


Number →	W-100	W-12W	W-750	W-625	W7W	W-375	W-250
Diameter Inches	1	7/8	3/4	5/8	1/2	3/8	1/4
Included Angle	90°	90°	90°	90°	90°	90°	90°

CARBIDE BURS
1/4" SHANKS

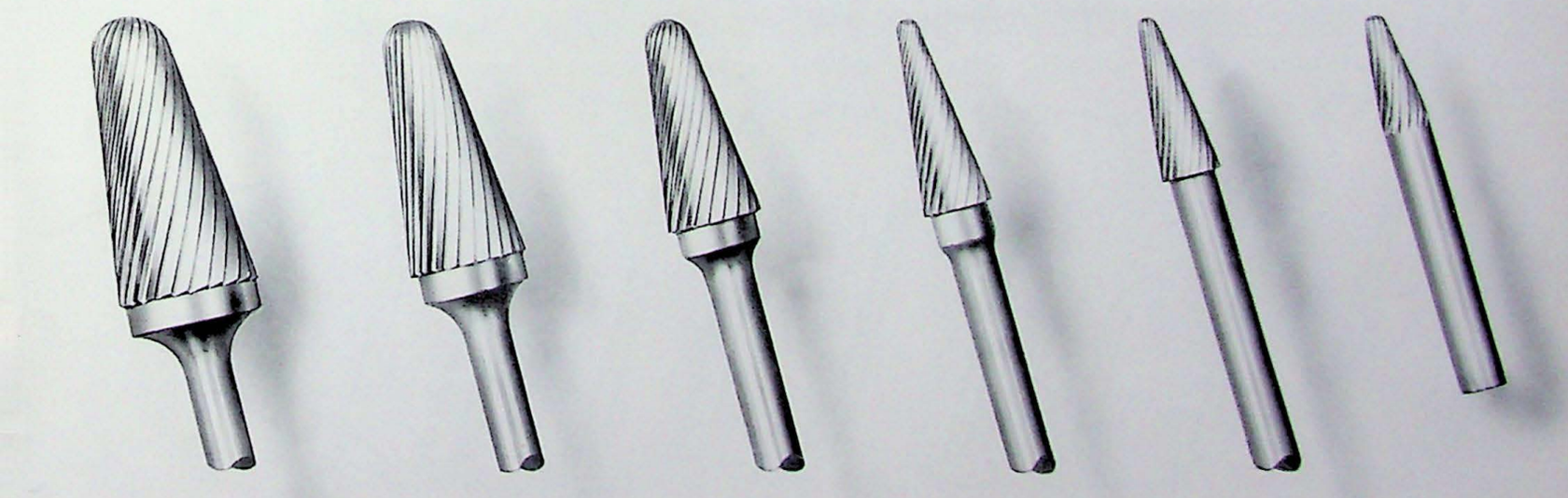
Stocked in Coarse, Standard and Fine Cuts

CONE SHAPE 82° INCLUDED ANGLE



Number →	Y-100	Y-750	Y-625	Y-500	Y-375	Y-250
Diameter Inches	1	3/4	5/8	1/2	3/8	1/4
Included Angle	82°	82°	82°	82°	82°	82°

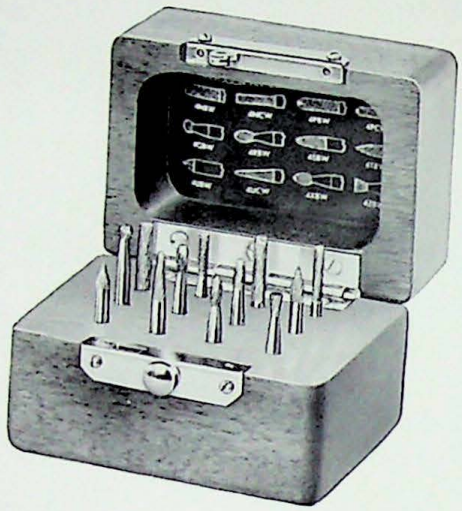
CONE SHAPE RADIUS END 14° INCLUDED ANGLE



Number →	US-750	US-625	US-500	US-375	US-312	US-250
Diameter by Length	3/4 x 1 1/2	5/8 x 1 5/16	1/2 x 1 1/8	3/8 x 1 1/16	5/16 x 7/8	1/4 x 5/8
Included Angle	14°	14°	14°	14°	14°	14°

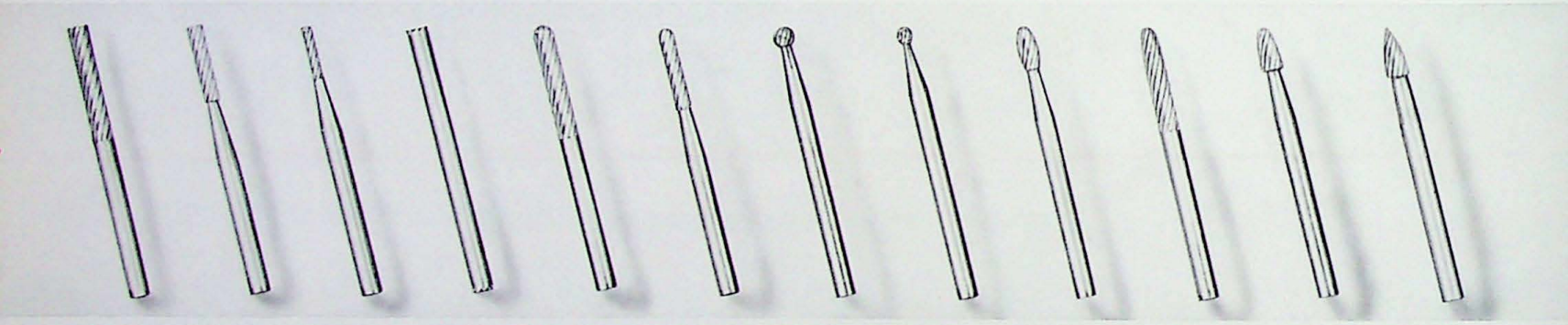
CARBIDE BURS
1/8" SHANKS

SOLID TUNGSTEN CARBIDE
1½" OVERALL
24 STANDARD SHAPES

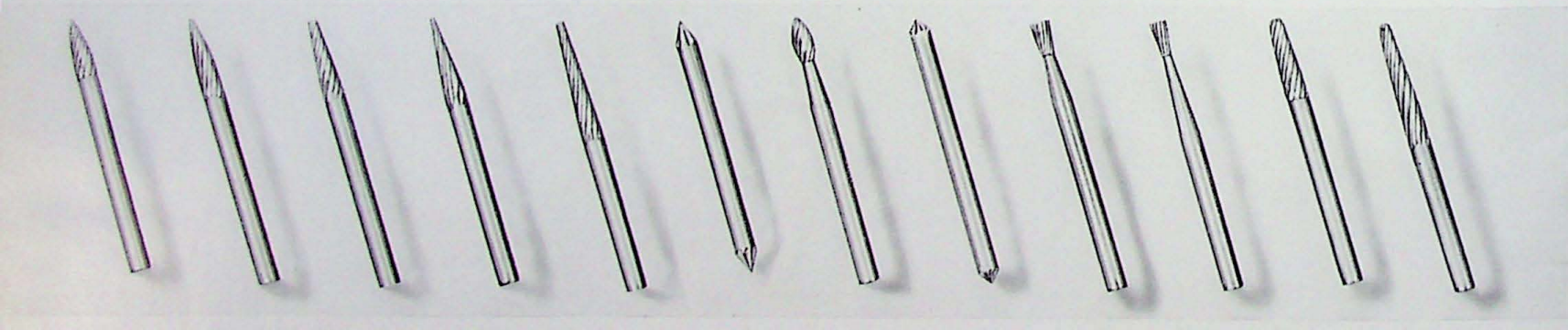


CARBISET NO. 100

The Nicholson Carbiset No. 100 consists of an attractive mahogany box containing an assortment of one each of the twelve most popular tools illustrated below and indicated by an asterisk. The set is available in coarse, standard and fine cuts. Any other assortment of twelve will be furnished in this box upon request. In addition, these tools can be furnished individually packed in plastic tubes.



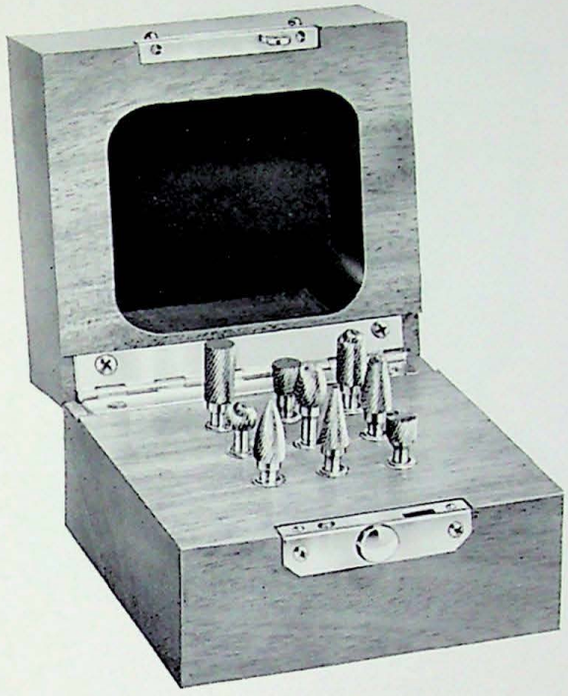
Number →	4NBW*	4NCW*	4N-062	4N-126	4PBW*	4PCW*	4QBW*	4Q-093	4RBW*	4S-125	4SBW*	4TBW*
Diameter by Length	1/8 x 9/16	3/32 x 7/16	1/16 x 1/4	1/8	1/8 x 7/16	3/32 x 7/16	1/8	3/32	1/8 x 7/32	1/8 x 1/2	1/8 x 1/4	1/8 x 1/4



Number →	4UBW*	4T-127	4U-127	4U-125	4U-126	4V-125	4XBW*	4W-125	4ZBW*	4M-093	4US-125	4UCW*
Diameter by Length	1/8 x 5/16	1/8 x 3/8	1/8 x 11/32	1/8 x 7/16	1/8 x 5/8	1/8 x 60°	1/8 x 1/4	1/8 x 90°	1/8 x 3/16	3/32 x 1/8	1/8 x 3/8	1/8 x 1/2

CARBIDE BURS
1/4" BURS ON 1/8" HEAT TREATED STEEL SHANKS

1½" MAXIMUM LENGTH
9 STANDARD SHAPES

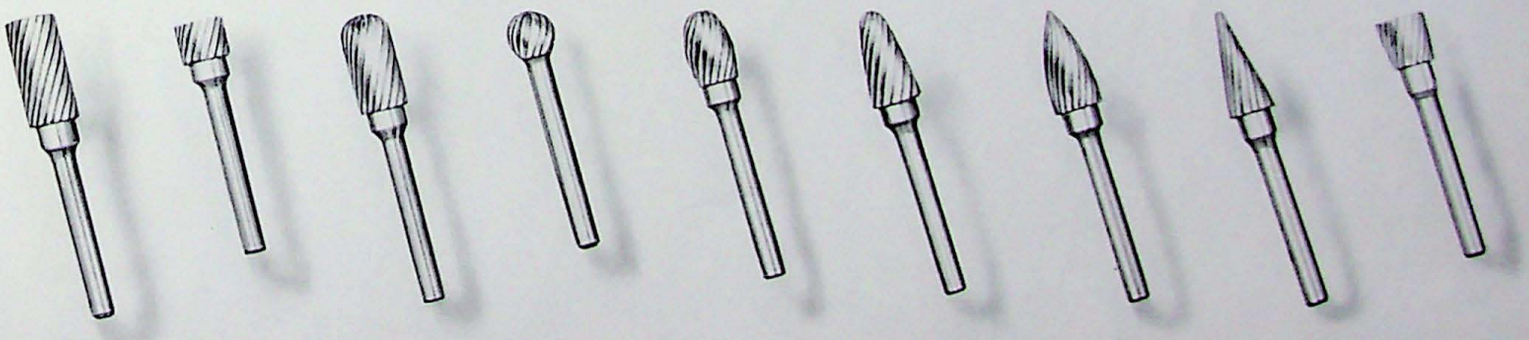


CARBISET NO. 108

The Nicholson Carbiset No. 108 is a popular selection of Carbide Burs designed for heavier work with small high speed air and electric tools. The solid tungsten carbide heads are brazed on hardened ground steel shanks. The burs are precision machine ground and perform well in free hand or fixed spindle operations.

Supplied individually or in sets.

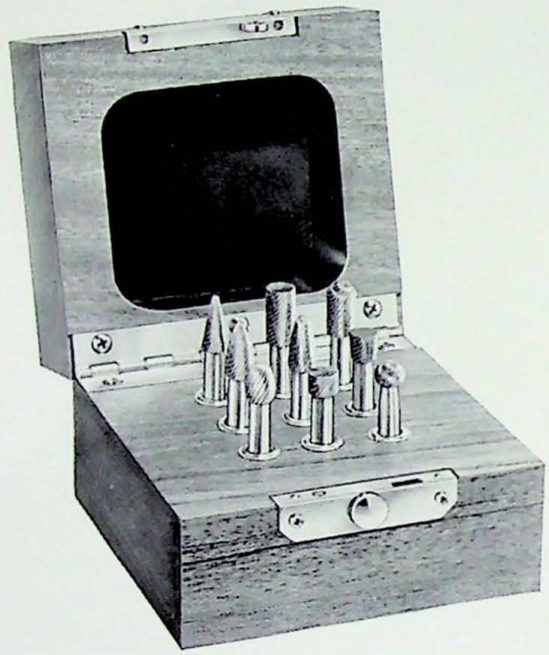
Coarse, Standard and Fine Cut.



Number →	8N-250	8N-251	8P-250	8Q-250	8R-250	8S-250	8T-250	8U-250	8M-250
Diameter by Length	¼ x ½	¼ x 3/16	¼ x ½	¼	¼ x 3/8	¼ x ½	¼ x ½	¼ x ½	¼ x ¼
Included Angle								22°	10°

CARBIDE BURS
1/4" BURS ON 3/16" HEAT TREATED STEEL SHANKS

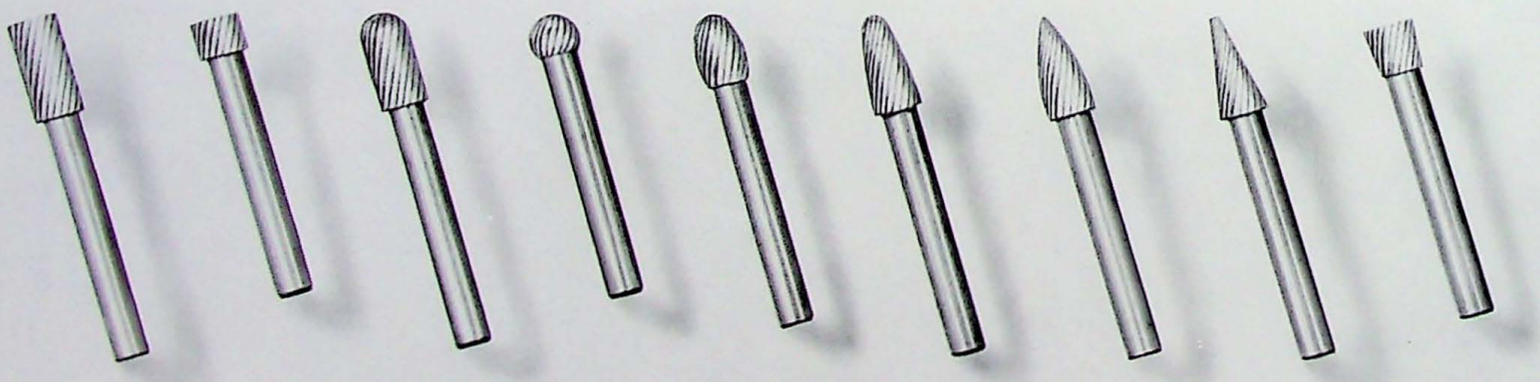
1½" MAXIMUM LENGTH
9 STANDARD SHAPES



CARBISET NO. 109

Carbiset No. 109 is identical to Nicholson's Carbiset No. 108 with one exception, the diameter of the shanks in the No. 109 Set are 3/16" and all burs are furnished having 20 flutes. Standard fluting can be furnished on special orders. This set is most widely used for application where a more rigid shank is required.

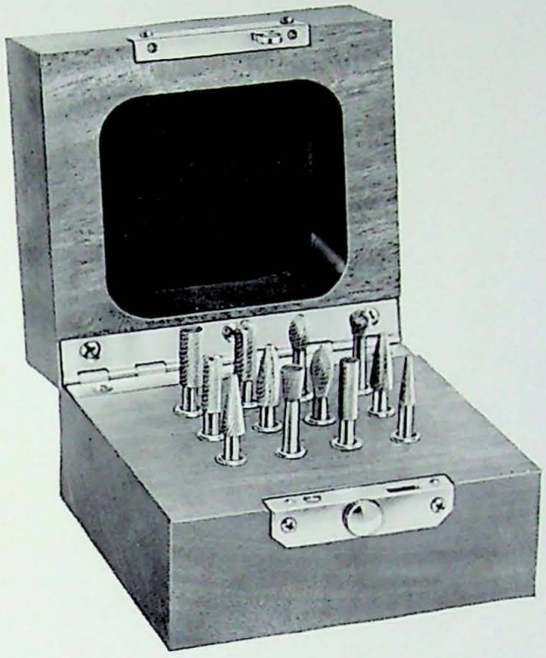
Supplied individually or in sets.



Number →	9N-250	9N-251	9P-250	9Q-250	9R-250	9S-250	9T-250	9U-250	9M-250
Diameter by Length	1/4 x 1/2	1/4 x 3/16	1/4 x 1/2	1/4	1/4 x 3/8	1/4 x 1/2	1/4 x 1/2	1/4 x 1/2	1/4 x 1/4
Included Angle								22°	10°

1½" OVERALL LENGTH
12 STANDARD SHAPES

CARBIDE BURS
5/32" AND 3/16" BURS ON 1/8" SHANKS (SOLID CARBIDE)

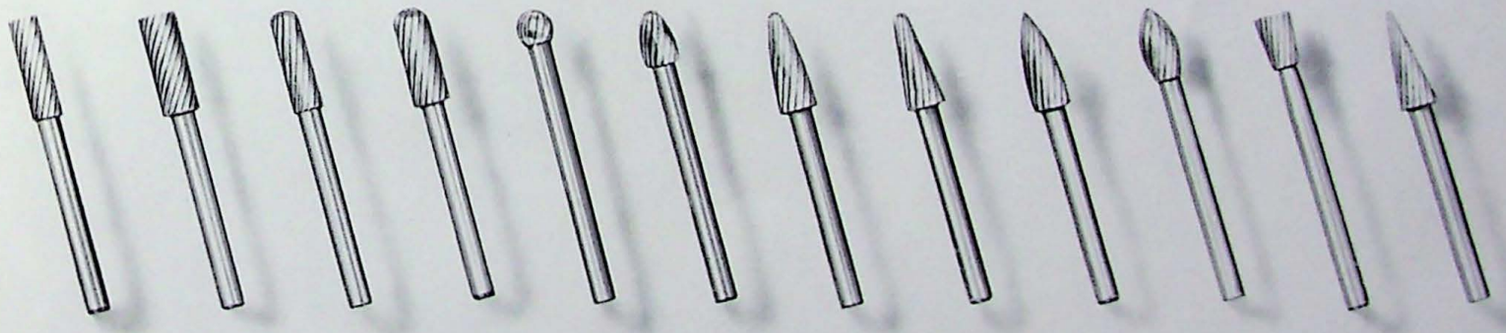


CARBISET NO. 105

The Carbide Burs found in Carbiset No. 105 are made up of intermediate sizes. These burs have proven useful for classes of work not suitable for the more common sizes listed in this catalog. The burs listed on this page and included in this set are made of Solid Carbide throughout.

Supplied individually or in sets.

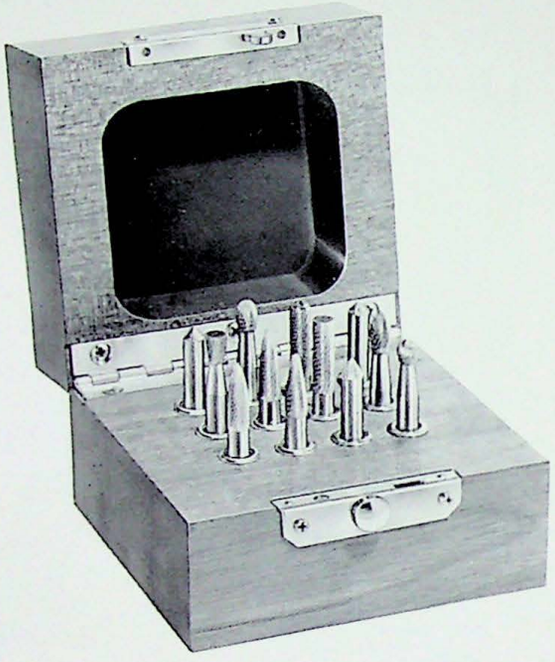
Coarse, Standard and Fine Cut.



Number →	5N-156	5N-187	5P-156	5P-187	5Q-187	5R-187	5S-187	5U-187	5T-187	5RT-187	5M-187	5U-187
Diameter by Length	5/32 x 1/2	3/16 x 1/2	5/32 x 1/2	3/16 x 1/2	3/16	3/16 x 9/32	3/16 x 1/2	3/16 x 1/2	3/16 x 1/2	3/16 x 3/8	3/16 x 1/4	3/16 x 1/2
Included Angle								16°			10°	14°

CARBIDE BURS
3/16" BURS ON 3/16" SHANKS (SOLID CARBIDE)

2" OVERALL LENGTH
12 STANDARD SHAPES

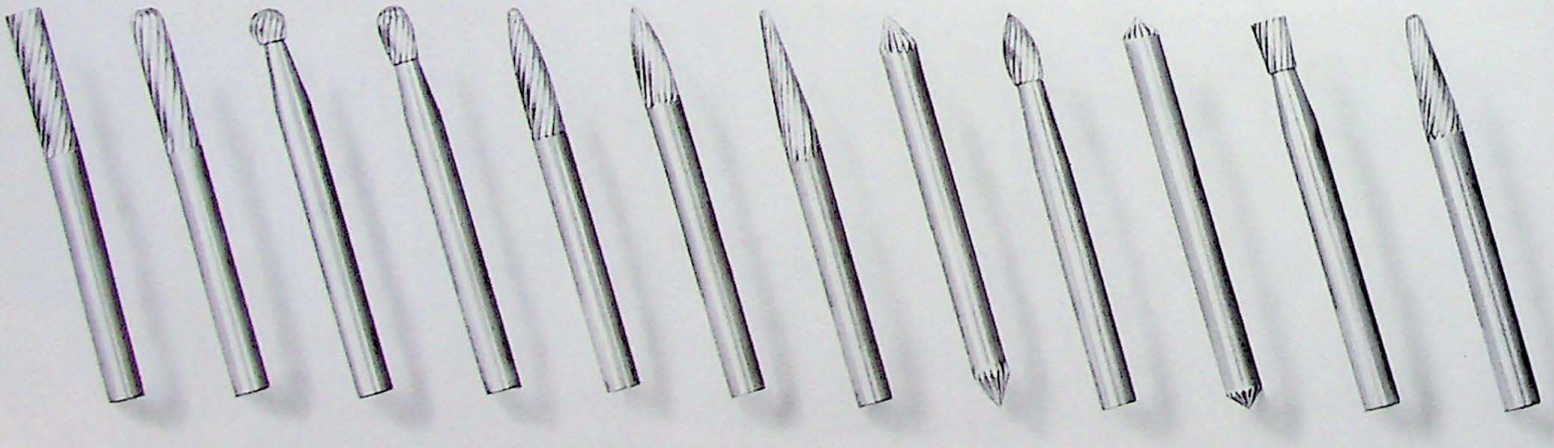


CARBISET NO. 106

Nicholson's Carbiset No. 106 is similar to Set No. 105, except that all the burs have 3/16" diameter heads. The shanks are also 3/16" diameter which makes this type of bur more suitable for jobs too heavy for those found in Carbiset No. 100 and lighter than 1/4" shank burs.

Supplied individually or in sets.

Coarse, Standard and Fine Cut.



Number →	6N-187	6P-187	6Q-187	6R-187	6S-187	6T-187	6U-187	6V-187	6RT-187	6W-187	6M-187	6US-187
Diameter by Length	3/16 x 5/8	3/16 x 5/8	3/16	3/16 x 9/32	3/16 x 1/2	3/16 x 1/2	3/16 x 5/8	3/16	3/16 x 3/8	3/16	3/16 x 1/4	3/16 x 7/16
Included Angle							12°	60°		90°	10°	14°

SOLID CARBIDE MIDGET BURS 3/32" DIAMETER SHANKS

1¼" OVERALL LENGTH

STANDARD AND COARSE CUT ONLY

Number →	3N-093	3N-078	3N-062	3P-093	3Q-093	3U-062	3Z-093
Diameter by Length	3/32 x 3/8	5/64 x 5/16	1/16 x 1/4	3/32 x 3/8	3/32	10°	10°

RECOMMENDED SPEEDS FOR NICHOLSON CARBIDE BURS

TABLE NO. 1. Approx. Recommended Speeds for:—Malleable Iron—Steel Welds—Cast Iron—Tool Steels—Die Steels—Naval Bronze—Brass—Aluminum, Etc.

TABLE NO. 2. Approx. Recommended Speeds for:—Stainless Steels.

NOTE: Diamond Cut Burs—Reduce Speed by approx. ⅓ to ½—in corresponding Tables and Cuts shown

	Coarse	Speed R.P.M.		Std.	Speed R.P.M.		Fine	Speed R.P.M.	
Bur Dia.	No. of Flutes	Table No. 1	Table No. 2	No. of Flutes	Table No. 1	Table No. 2	No. of Flutes	Table No. 1	Table No. 2
1/16	8	65,000	98,000	14	50,000	75,000	20	30,000	45,000
3/32	10	55,000	83,000	18	40,000	60,000	24	25,000	38,000
1/8	12	45,000	68,000	20	35,000	53,000	28	20,000	30,000
3/16	14	39,000	59,000	24	25,000	38,000	34	16,000	24,000
1/4	15	35,000	53,000	27	22,000	33,000	42	14,000	21,000
5/16	16	32,000	48,000	30	20,000	30,000	48	12,000	18,000
3/8	18	29,000	44,000	32	18,000	27,000	52	11,000	17,000
7/16	18	27,000	41,000	34	17,000	26,000	54	10,500	15,800
1/2	20	25,000	38,000	36	16,000	24,000	56	10,000	15,000
5/8	22	23,000*	35,000†	38	15,000	23,000	60	9,500	14,300
3/4	24	20,000*	30,000†	40	14,000	21,000	64	9,000	13,500
7/8	25	19,000*	29,000†	42	13,000	20,000	68	8,500	12,700
1	27	18,000*	27,000†	44	12,000	18,000	72	8,000	12,000

*Maximum speeds recommended on Burs supplied with 1/4" diameter shanks.

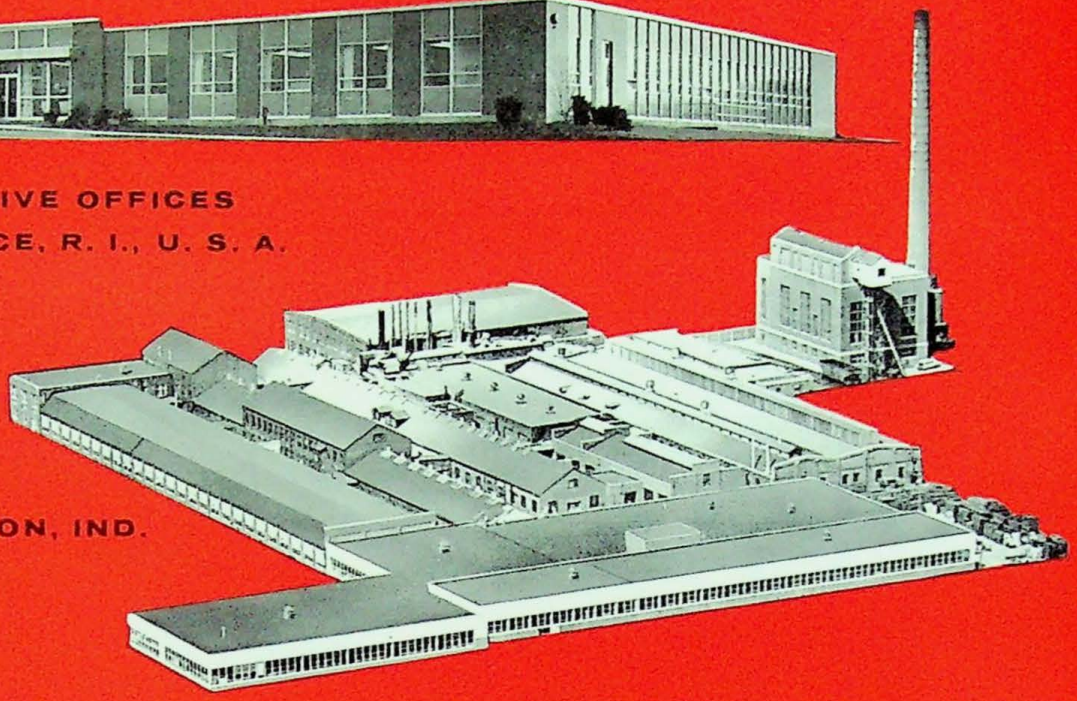
†As a safety factor, we highly recommend 5/16" diameter shanks on 5/8" and 3/4" diameter Burs if speeds above 15,000 R. P. M. are being applied, and—

†3/8" diameter shanks on 7/8" and 1" diameter Burs if speeds above 10,000 R. P. M. are being applied.

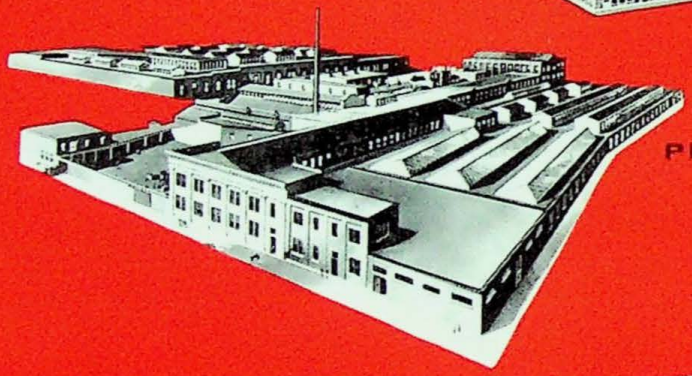
CAUTION: Be sure to chuck Bur shank true and to full capacity of the machine chuck.

IMPORTANT: Above recommended speeds are applicable only if Bur is chucked to full length of shank supplied thereon.

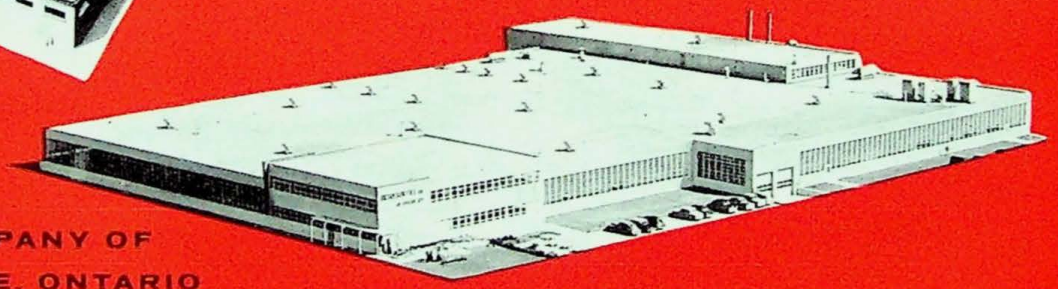
EXECUTIVE OFFICES
PROVIDENCE, R. I., U. S. A.



PLANT AT ANDERSON, IND.
U. S. A.



PLANT AT PHILADELPHIA, PA.
U. S. A.



NICHOLSON FILE COMPANY OF
CANADA LTD. PORT HOPE, ONTARIO

NICHOLSON FILE NEDERLAND, N.V. 's-HERTOGENBOSCH, NETHERLANDS

NICHOLSON FILE COMPANY • PROVIDENCE 1, R. I.

Form 244-12-67 Printed in U.S.A.

NICHOLSON FILE COMPANY

NET PRICES TO CONSUMERS

OF HAND CUT ROTARY FILES — GROUND BURS — CARBIDE BURS AND ASSORTMENTS

¼" DIAMETER SHANKS — HAND CUT ROTARY FILES — HI-SPEED STEEL

DESCRIPTION AND CODE NO.	Diameter By Length	Coarse or Medium QUANTITY 1 to 11	Coarse or Medium QUANTITY 12 to 49	Coarse or Medium QUANTITY 50 or More	Fine Cut QUANTITY 1 to 11	Fine Cut QUANTITY 12 to 49	Fine Cut QUANTITY 50 or More
CYLINDRICAL SHAPE FLAT END							
A1G	⅛ x ½	1.58	1.47	1.35	1.99	1.85	1.71
A1G (With End Cut)	⅛ x ½	1.58	1.47	1.35	1.99	1.85	1.71
A3P	¼ x 1	1.73	1.61	1.48	2.11	1.96	1.81
A3P (With End Cut)	¼ x 1	1.73	1.61	1.48	2.11	1.96	1.81
A3U	¼ x 1½	1.96	1.82	1.68	2.37	2.20	2.03
A4U	5/16 x 1½	2.11	1.96	1.81	2.26	2.10	1.94
A5P	⅜ x 1	1.99	1.85	1.71	2.48	2.31	2.13
A5U	⅜ x 1½	2.18	2.03	1.87	2.86	2.66	2.45
A7P	½ x 1	2.22	2.06	1.90	2.82	2.62	2.42
A7U	½ x 1½	2.56	2.38	2.19	3.24	3.00	2.77
A9P	⅝ x 1	2.60	2.41	2.23	3.31	3.07	2.84
A10G	¾ x ½	2.60	2.41	2.23	3.31	3.07	2.84
A10K	¾ x ¾	2.93	2.73	2.52	3.61	3.35	3.10
A14P	1 x 1	4.36	4.05	3.74	5.42	5.03	4.64
CYLINDRICAL SHAPE RADIUS END							
B1G	⅛ x ½	1.58	1.47	1.35	1.99	1.85	1.71
B3P	¼ x 1	1.81	1.68	1.55	2.18	2.03	1.87
B3U	¼ x 1½	1.99	1.85	1.71	2.48	2.31	2.13
B4U	5/16 x 1½	2.18	2.03	1.87	2.71	2.52	2.32
B5P	⅜ x 1	1.99	1.85	1.71	2.48	2.31	2.13
B5U	⅜ x 1½	2.33	2.17	2.00	2.86	2.66	2.45
B7P	½ x 1	2.33	2.17	2.00	2.86	2.66	2.45
B7U	½ x 1½	2.75	2.55	2.35	3.42	3.18	2.93
B9P	⅝ x 1	2.60	2.41	2.23	3.24	3.00	2.77
B10R	¾ x 1¼	3.95	3.67	3.39	4.85	4.51	4.16
BALL SHAPE							
C1	⅛	1.55	1.40	1.29	1.81	1.68	1.55
C2	3/16	1.58	1.47	1.35	1.96	1.82	1.68
C3	¼	1.62	1.50	1.39	1.99	1.85	1.71
C4	5/16	1.69	1.57	1.45	2.11	1.96	1.81
C5	⅜	1.88	1.75	1.61	2.33	2.17	2.00
C7	½	2.26	2.10	1.94	2.75	2.55	2.35
C9	⅝	2.48	2.31	2.13	3.09	2.86	2.64
C10	¾	2.90	2.69	2.48	3.69	3.42	3.16
C14	1	4.36	4.05	3.74	5.27	4.89	4.52
OVAL SHAPE							
D3G	¼ x ½	1.81	1.68	1.55	2.22	2.06	1.90
D5K	⅜ x ¾	2.11	1.96	1.81	2.56	2.38	2.19
D6L	7/16 x 13/16	2.18	2.03	1.87	2.71	2.52	2.32
D7M	½ x ⅞	2.33	2.17	2.00	2.86	2.66	2.45
D9N	⅝ x 15/16	2.37	2.20	2.03	2.93	2.73	2.52
D10P	¾ x 1	3.24	3.00	2.77	3.99	3.70	3.42
D14S	1 x 1⅜	5.55	5.14	4.75	6.81	6.33	5.85
TREE SHAPE RADIUS END							
E3K	¼ x ¾	1.88	1.75	1.61	2.33	2.17	2.00
E5K	⅜ x ¾	2.11	1.96	1.81	2.56	2.38	2.19
E7Q	½ x 1⅛	2.37	2.20	2.03	2.97	2.76	2.55
E10P	¾ x 1	3.72	3.46	3.19	4.55	4.23	3.90
E15Y	1⅛ x 2	8.16	7.58	7.00	10.05	9.33	8.61

DESCRIPTION AND CODE NO.	Diameter By Length	Coarse or Medium QUANTITY 1 to 11	Coarse or Medium QUANTITY 12 to 49	Coarse or Medium QUANTITY 50 or More	Fine Cut QUANTITY 1 to 11	Fine Cut QUANTITY 12 to 49	Fine Cut QUANTITY 50 or More
TREE SHAPE POINTED END							
F3G	¼ x ½	1.84	1.71	1.58	2.22	2.06	1.90
F5K	⅜ x ¾	2.11	1.96	1.81	2.56	2.38	2.19
F7K	½ x ¾	2.18	2.03	1.87	2.71	2.52	2.32
F7Q	½ x 1⅛	2.48	2.31	2.13	3.09	2.86	2.64
F9P	⅝ x 1	3.24	3.00	2.77	4.03	3.74	3.45
F15Y	1⅛ x 2	8.16	7.58	7.00	10.05	9.33	8.61
CONE SHAPE							
G3G	¼ x ½	1.69	1.57	1.45	2.11	1.96	1.81
G3K	¼ x ¾	1.81	1.68	1.55	2.18	2.03	1.87
G3P	¼ x 1	2.11	1.96	1.81	2.56	2.38	2.19
G3R	¼ x 1¼	2.11	1.96	1.81	2.56	2.38	2.19
G4K	5/16 x ¾	2.11	1.96	1.81	2.56	2.38	2.19
G4P	5/16 x 1	2.18	2.03	1.87	2.71	2.52	2.32
G5J	⅜ x ⅝	2.18	2.03	1.87	2.71	2.52	2.32
G7M	½ x ⅞	2.33	2.17	2.00	2.86	2.66	2.45
G9P	⅝ x 1	2.48	2.31	2.13	3.12	2.90	2.68
CONE SHAPE 60° INCLUDED ANGLE							
H5	⅜	2.05	1.91	1.76	2.48	2.30	2.11
H7	½	2.37	2.20	2.03	2.93	2.73	2.52
H9	⅝	2.82	2.62	2.42	3.57	3.32	3.06
H10	¾	3.42	3.18	2.93	4.36	4.05	3.74
H14	1	4.18	3.88	3.58	5.08	4.72	4.35
CONE SHAPE 90° INCLUDED ANGLE							
J5	⅜	1.84	1.71	1.58	2.22	2.06	1.90
J7	½	2.18	2.03	1.87	2.75	2.55	2.35
J9	⅝	2.48	2.31	2.13	3.12	2.90	2.68
J10	¾	3.09	2.86	2.64	3.84	3.56	3.29
J14	1	3.69	3.42	3.16	5.08	4.72	4.35
FLAME SHAPE							
K9M	⅝ x ⅞	2.60	2.41	2.23	3.31	3.07	2.84
K9T	⅝ x 17/16	4.36	4.05	3.74	5.46	5.07	4.68
K10W	¾ x 1¾	5.42	5.03	4.64	6.70	6.22	5.74
BI SHAPE							
L3P	¼ x 1	2.11	1.96	1.81	2.56	2.38	2.19
L4Q	5/16 x 1⅛	2.18	2.03	1.87	2.71	2.52	2.32
L5Q	⅜ x 1⅛	2.18	2.03	1.87	2.71	2.52	2.32
INVERTED CONE SHAPE							
M10J	⅜ x ⅝	2.18	2.03	1.87	2.71	2.52	2.32
CONCAVE SHAPE							
AA10J	¾ x ⅝	3.24	3.00	2.77	3.99	3.70	3.42
BB3	¼	2.11	1.96	1.81	2.56	2.38	2.19
BARREL SHAPE							
CC7P	½ x 1	2.37	2.20	2.03	2.93	2.73	2.52
CYLINDRICAL DOUBLE TAPER							
DD15E	1⅛ x ⅜	4.10	3.81	3.52	5.08	4.72	4.35

NICHOLSON U.S.A.

NICHOLSON FILE COMPANY

NET PRICES TO CONSUMERS *(Continued)*

¼" DIAMETER SHANKS – GROUND BURS – HI-SPEED STEEL

CODE NO.	Diameter By Length	Coarse or Medium QUANTITY 1 to 11	Coarse or Medium QUANTITY 12 to 49	Coarse or Medium QUANTITY 50 to 149	Fine Cut QUANTITY 1 to 11	Fine Cut QUANTITY 12 to 49	Fine Cut QUANTITY 50 to 149
CYLINDRICAL SHAPE FLAT END							
N1G	1/8 x 1/2	1.73	1.61	1.48	2.07	1.92	1.77
N1G (With End Cut)	1/8 x 1/2	2.07	1.92	1.77	2.48	2.31	2.13
N3P	1/4 x 1	2.18	2.03	1.87	2.63	2.45	2.26
N3P (With Cut End)	1/4 x 1	2.48	2.31	2.13	2.97	2.76	2.55
N3U	1/4 x 1 1/2	2.58	2.48	2.31	3.06	2.85	2.64
N3U (With Cut End)	1/4 x 1 1/2	2.63	2.58	2.38	3.27	3.05	2.81
N4P	5/16 x 1	2.50	2.32	2.12	2.99	2.79	2.55
N4P (With Cut End)	5/16 x 1	2.71	2.50	2.32	3.19	2.95	2.73
N5P	3/8 x 1	2.60	2.41	2.23	3.12	2.90	2.68
N5P (With Cut End)	3/8 x 1	3.05	2.83	2.61	3.65	3.39	3.13
N5U	3/8 x 1 1/2	3.57	3.32	3.06	4.29	3.98	3.68
N5U (With Cut End)	3/8 x 1 1/2	3.99	3.70	3.42	4.78	4.44	4.10
N7P	1/2 x 1	3.24	3.00	2.77	3.88	3.60	3.32
N7P (With Cut End)	1/2 x 1	3.80	3.53	3.26	4.55	4.23	3.90
N9P	5/8 x 1	4.10	3.81	3.52	4.93	4.58	4.22
N9P (With Cut End)	5/8 x 1	4.82	4.47	4.13	5.79	5.38	4.97
N10G	3/4 x 1/2	3.85	3.59	3.31	4.65	4.22	3.98
N10G (With Cut End)	3/4 x 1/2	4.07	3.79	3.49	4.87	4.50	4.15
N10K	3/4 x 3/4	4.44	4.12	3.81	5.34	4.96	4.58
N10K (With Cut End)	3/4 x 3/4	5.23	4.86	4.48	6.28	5.83	5.39
N14P	1 x 1	6.21	5.76	5.32	7.45	6.92	6.39
N14P (With Cut End)	1 x 1	7.34	6.81	6.29	8.80	8.18	7.55
CYLINDRICAL SHAPE RADIUS END							
P1G	1/8 x 1/2	1.81	1.68	1.55	2.18	2.03	1.87
P3P	1/4 x 1	2.33	2.17	2.00	2.82	2.62	2.42
P3U	1/4 x 1 1/2	2.73	2.54	2.36	3.28	3.05	2.81
P5P	3/8 x 1	2.97	2.76	2.55	3.57	3.32	3.06
P5U	3/8 x 1 1/2	3.89	3.33	3.07	4.30	4.00	3.70
P7P	1/2 x 1	3.61	3.35	3.10	4.33	4.02	3.71
P9P	5/8 x 1	4.10	3.81	3.52	4.93	4.58	4.22
P10R	3/4 x 1 1/4	5.61	5.21	4.81	6.73	6.25	5.77
BALL SHAPE							
Q1	1/8	1.62	1.50	1.39	1.96	1.82	1.68
Q2	3/16	1.69	1.57	1.45	2.03	1.89	1.74
Q3	1/4	1.69	1.57	1.45	2.03	1.89	1.74
Q4	5/16	1.99	1.85	1.71	2.41	2.24	2.06
Q5	3/8	2.22	2.06	1.90	2.67	2.48	2.29
Q7	1/2	2.86	2.66	2.45	3.42	3.18	2.93
Q9	5/8	3.46	3.21	2.97	4.18	3.88	3.58
Q10	3/4	4.55	4.23	3.90	5.46	5.07	4.68
Q14	1	5.94	5.52	5.10	7.15	6.64	6.13
OVAL SHAPE							
R3G	1/4 x 1/2	1.81	1.68	1.55	2.18	2.03	1.87
R5K	3/8 x 3/4	2.48	2.31	2.13	2.97	2.76	2.55
R6L	7/16 x 13/16	2.75	2.55	2.35	3.31	3.07	2.84
R7M	1/2 x 7/8	3.31	3.07	2.84	3.99	3.70	3.42
R9N	5/8 x 15/16	3.73	3.46	3.20	4.49	4.18	3.82
R10P	3/4 x 1	4.85	4.51	4.16	5.83	5.42	5.00
R14S	1 x 1 3/8	7.45	6.92	6.39	8.95	8.32	7.68
TREE SHAPE RADIUS END							
S1F	1/8 x 7/16	1.82	1.67	1.43	2.11	1.97	1.83
S3K	1/4 x 3/4	2.07	1.92	1.77	2.48	2.31	2.13
S5K	3/8 x 3/4	2.82	2.62	2.42	3.39	3.14	2.90
S7Q	1/2 x 1 1/8	3.80	3.53	3.26	4.55	4.23	3.90
S10P	3/4 x 1	5.10	4.75	4.38	6.15	5.71	5.27
S15Y	1 1/8 x 2	10.80	10.03	9.26	12.94	12.02	11.09

CODE NO.	Diameter By Length	Coarse or Medium QUANTITY 1 to 11	Coarse or Medium QUANTITY 12 to 49	Coarse or Medium QUANTITY 50 to 149	Fine Cut QUANTITY 1 to 11	Fine Cut QUANTITY 12 to 49	Fine Cut QUANTITY 50 to 149
TREE SHAPE POINTED END							
T3G	1/4 x 1/2	1.99	1.85	1.71	2.40	2.23	2.07
T5K	3/8 x 3/4	2.75	2.55	2.35	3.31	3.07	2.84
T7K	1/2 x 3/4	3.42	3.18	2.93	4.10	3.81	3.52
T7Q	1/2 x 1 1/8	3.84	3.56	3.29	4.59	4.26	3.93
T9P	5/8 x 1	4.37	4.06	3.74	5.23	4.87	4.49
T15Y	1 1/8 x 2	11.10	10.31	9.51	13.30	12.35	11.40
CONE SHAPE							
U3G	1/4 x 1/2	1.88	1.75	1.61	2.26	2.10	1.94
U3K	1/4 x 3/4	2.07	1.92	1.77	2.48	2.31	2.13
U3P	1/4 x 1	2.22	2.06	1.90	2.67	2.48	2.29
U3R	1/4 x 1 1/4	2.50	2.32	2.14	2.99	2.78	2.55
U4K	5/16 x 3/4	2.37	2.20	2.03	2.86	2.66	2.45
U4P	5/16 x 1	2.56	2.38	2.19	3.09	2.86	2.64
U5J	3/8 x 5/8	2.50	2.32	2.14	2.99	2.78	2.55
U7M	1/2 x 7/8	3.31	3.07	2.84	3.99	3.70	3.42
U9P	5/8 x 1	4.21	3.91	3.61	5.04	4.68	4.32
CONE SHAPE 60° INCLUDED ANGLE							
V5	3/8	2.33	2.17	2.00	2.78	2.59	2.39
V7	1/2	2.97	2.76	2.55	3.57	3.32	3.06
V9	5/8	3.57	3.32	3.06	4.29	3.98	3.68
V10	3/4	4.36	4.05	3.74	5.23	4.86	4.48
V14	1	6.21	5.76	5.32	7.45	6.92	6.39
CONE SHAPE 90° INCLUDED ANGLE							
W5	3/8	2.22	2.06	1.90	2.67	2.48	2.29
W7	1/2	2.86	2.66	2.45	3.42	3.18	2.93
W9	5/8	3.57	3.32	3.06	4.29	3.98	3.68
W10	3/4	4.18	3.88	3.58	5.00	4.65	4.29
W14	1	5.83	5.42	5.00	7.00	6.50	6.00
FLAME SHAPE							
X9M	5/8 x 7/8	4.37	4.06	3.74	5.23	4.87	4.49
X9T	5/8 x 17/16	5.94	5.52	5.10	7.15	6.64	6.13
X10W	3/4 x 1 3/4	7.83	7.27	6.71	9.41	8.73	8.06
BI SHAPE							
Y3P	1/4 x 1	2.48	2.31	2.13	2.97	2.76	2.55
Y4Q	5/16 x 1 1/8	2.97	2.76	2.55	3.57	3.32	3.06
Y5Q	3/8 x 1 1/8	3.24	3.00	2.77	3.88	3.60	3.32
INVERTED CONE SHAPE							
Z10J	3/4 x 5/8	4.03	3.74	3.45	4.82	4.47	4.13
Z10J (With Cut End)	3/4 x 5/8	4.85	4.51	4.16	5.83	5.42	5.00
CONCAVE SHAPE							
NN10J	3/4 x 5/8	5.83	5.42	5.00	7.00	6.50	6.00
PP3	1/4	6.23	5.79	5.35	7.48	6.95	6.42
BARREL SHAPE							
QQ7P	1/2 x 1	3.45	3.19	2.97	4.15	3.85	3.57
CYLINDRICAL DOUBLE TAPER							
RR15E	1 1/8 x 3/8	6.70	6.22	5.74	8.05	7.48	6.90

QUANTITIES OF 150 OR MORE GROUND BURS – PRICES ON APPLICATION

NICHOLSON FILE COMPANY

NET PRICES TO CONSUMERS *(Continued)*

¼" DIAMETER SHANKS — THREE POPULAR ASSORTMENTS — HI-SPEED STEEL

ROTARY FILES AND GROUND BURS

ASSORTMENT	ITEMS IN SET	NET PER SET QUANTITY 1 to 11 Sets	NET PER SET QUANTITY 12 to 49 Sets	NET PER SET QUANTITY 50 or More Sets
No. 20 Rotakit	10 Ground Burs	29.54	27.42	25.31
No. 30 Rotakit	10 Rotary Files	21.69	20.14	18.64
No. 40 Rotakit	5 Ground Burs and 5 Rotary Files	28.50	26.64	24.41

⅛" DIAMETER SHANKS — HAND CUT AND GROUND BURS — HI-SPEED STEEL

HAND CUT					GROUND BURS				
CODE NO.	Diameter By Length	EACH NET Quantity 1 to 11	Quantity 12 to 49	Quantity 50 and Over	CODE NO.	Diameter By Length	EACH NET Quantity 1 to 11	Quantity 12 to 49	Quantity 50 to 149
4A9A	⅝ x ⅛	2.07	1.92	1.77	4N9A	⅝ x ⅛	2.07	1.92	1.77
4A3G	¼ x ½	1.73	1.61	1.48	4N3G	¼ x ½	1.73	1.61	1.48
4A1J	⅛ x ⅝	1.35	1.26	1.16	4N1J	⅛ x ⅝	1.35	1.26	1.16
4B3C	¼ x ¼	1.73	1.61	1.48	4P3C	¼ x ¼	1.73	1.61	1.48
4B1J	⅛ x ⅝	1.35	1.26	1.16	4P1J	⅛ x ⅝	1.35	1.26	1.16
4H9A	⅝ x ⅛	2.07	1.92	1.77	4V9A	⅝ x ⅛	2.07	1.92	1.77
4C5	⅜	1.73	1.61	1.48	4Q5	⅜	1.73	1.61	1.48
4C3	¼	1.73	1.61	1.48	4Q3	¼	1.73	1.61	1.48
4D3G	¼ x ½	1.73	1.61	1.48	4R3G	¼ x ½	1.73	1.61	1.48
4D3D	¼ x 5/16	1.73	1.61	1.48	4R3D	¼ x 5/16	1.73	1.61	1.48
4F3G	¼ x ½	1.73	1.61	1.48	4T3G	¼ x ½	1.73	1.61	1.48
4G3G	¼ x ½	1.73	1.61	1.48	4U3G	¼ x ½	1.73	1.61	1.48
4G3C	¼ x ¼	1.73	1.61	1.48	4U3C	¼ x ¼	1.73	1.61	1.48
4G1H	⅛ x 5/16	1.35	1.26	1.16	4U1H	⅛ x 5/16	1.35	1.26	1.16
4G1C	⅛ x ¼	1.35	1.26	1.16	4U1C	⅛ x ¼	1.35	1.26	1.16
4G5E	⅜ x ⅜	1.73	1.61	1.48	4U5E	⅜ x ⅜	1.73	1.61	1.48
4K3G	¼ x ½	1.73	1.61	1.48	4X3G	¼ x ½	1.73	1.61	1.48
4L5C	⅜ x ¼	1.73	1.61	1.48	4Y5C	⅜ x ¼	1.73	1.61	1.48

ROTASETS — ⅛" DIAMETER SHANK ROTARY FILES AND GROUND BURS — HI-SPEED STEEL

ASSORTMENT	ITEMS IN SET	NET PER SET QUANTITY 1 to 11 Sets	NET PER SET QUANTITY 12 to 49 Sets	NET PER SET QUANTITY 50 or More Sets
No. 55 Rotaset	8 Ground Burs	13.55	12.53	11.66
No. 66 Rotaset	8 Rotary Files	13.55	12.53	11.66
No. 77 Rotaset	9 Ground Burs and 9 Rotary Files	30.57	28.32	26.31
No. 88 Rotaset	18 Ground Burs	30.57	28.32	26.31
No. 99 Rotaset	18 H. C. Rotary Files	30.57	28.32	26.31

NICHOLSON FILE COMPANY

NET PRICES TO CONSUMERS *(Continued)*

NICHOLSON CARBIDE BURS — ¼" DIAMETER SHANKS

DESCRIPTION AND CODE NO.	Diameter By Length	QUANTITY 1-49 ASSORTED		QUANTITY 50-199 ASSORTED		QUANTITY 200-499 ASSORTED	
		Coarse & Standard	Fine	Coarse & Standard	Fine	Coarse & Standard	Fine
CYLINDRICAL SHAPE FLAT END*							
N-125	1/8 x 1/2	5.50	6.10	5.23	5.80	4.95	5.49
N-156	5/32 x 5/8	6.30	6.90	5.99	6.56	5.67	6.21
N-187	3/16 x 5/8	6.40	7.10	6.08	6.75	5.76	6.39
N3JW	1/4 x 5/8	6.80	7.50	6.46	7.13	6.12	6.75
N-312	5/16 x 3/4	8.20	9.00	7.79	8.55	7.38	8.10
N5KW	3/8 x 3/4	9.30	10.30	8.84	9.79	8.37	9.27
N-437	7/16 x 1	12.00	13.90	11.40	13.21	10.80	12.51
N7PW	1/2 x 1	14.70	16.20	13.97	15.39	13.23	14.58
N-625	5/8 x 1	19.70	21.70	18.72	20.62	17.73	19.53
N-752	3/4 x 1/2	21.20	23.30	20.14	22.14	19.08	20.97
N-751	3/4 x 3/4	23.90	26.30	22.71	24.99	21.51	23.67
N-750	3/4 x 1	27.25	30.00	25.89	28.50	24.53	27.00
N-100	1 x 1	45.00	49.50	42.75	47.03	40.50	44.55
*Can be furnished with Cut End at 10% additional.							
CYLINDRICAL SHAPE RADIUS END							
P-125	1/8 x 1/2	5.90	6.50	5.61	6.18	5.31	5.85
P-156	5/32 x 5/8	6.90	7.60	6.56	7.22	6.21	6.84
P-187	3/16 x 5/8	7.20	8.00	6.84	7.60	6.48	7.20
P3JW	1/4 x 5/8	7.40	8.20	7.03	7.79	6.66	7.38
P-312	5/16 x 3/4	8.80	9.70	8.36	9.22	7.92	8.73
P5KW	3/8 x 3/4	9.90	10.90	9.41	10.36	8.91	9.81
P-437	7/16 x 1	13.60	15.00	12.92	14.25	12.24	13.50
P7PW	1/2 x 1	15.70	17.30	14.92	16.44	14.13	15.57
P9PW	5/8 x 1	21.00	23.10	19.95	21.95	18.90	20.79
P-750	3/4 x 1	29.70	32.70	28.22	31.07	26.73	29.43
BALL SHAPE							
Q-125	1/8	5.80	6.40	5.51	6.08	5.22	5.76
Q-187	3/16	6.80	7.50	6.46	7.13	6.12	6.75
Q3W	1/4	7.20	8.00	6.84	7.60	6.48	7.20
Q-312	5/16	7.70	8.50	7.32	8.08	6.93	7.65
Q5W	3/8	8.80	9.70	8.36	9.22	7.92	8.73
Q-437	7/16	11.10	12.20	10.55	11.59	9.99	10.98
Q7W	1/2	12.20	13.50	11.59	12.83	10.98	12.15
Q9W	5/8	15.50	17.10	14.73	16.25	13.95	15.39
Q10W	3/4	21.00	23.10	19.95	21.95	18.90	20.79
Q14W	1	35.00	38.50	33.25	36.58	31.50	34.65
OVAL SHAPE							
R-250	1/4 x 3/8	7.90	8.70	7.51	8.27	7.11	7.83
R-375	3/8 x 5/8	9.90	10.90	9.41	10.36	8.91	9.81
R7MW	1/2 x 7/8	14.60	16.10	13.87	15.30	13.14	14.49
R9PW	5/8 x 1	21.00	23.10	19.95	21.95	18.90	20.79
R-750	3/4 x 1	29.00	31.90	27.55	30.31	26.10	28.71
FLAME SHAPE							
X-312	5/16 x 3/4	10.80	11.90	10.26	11.31	9.72	10.71
X-500	1/2 x 1 1/4	21.60	23.80	20.52	22.61	19.44	21.42
X-625	5/8 x 1 1/16	31.00	34.10	29.45	32.40	27.90	30.69
X-750	3/4 x 1 5/8	45.00	49.50	42.75	47.03	40.50	44.55
INVERTED CONE SHAPE							
M-250	1/4 x 5/16	7.60	8.40	7.22	7.98	6.84	7.56
M-500	1/2 x 1/2	14.80	16.30	14.06	15.49	13.32	14.67
M-625	5/8 x 3/4	19.70	21.70	18.72	20.62	17.73	19.53
M-750	3/4 x 5/8	26.60	29.30	25.27	27.84	23.94	26.37

DIAMOND CUT BURS 20% ADDITIONAL
PRICES ON QUANTITIES OF 500 OR MORE ON APPLICATION

NICHOLSON U.S.A.

NICHOLSON FILE COMPANY

NET PRICES TO CONSUMERS *(Continued)*

NICHOLSON CARBIDE BURS — ¼" DIAMETER SHANKS

DESCRIPTION AND CODE NO.	Diameter By Length	QUANTITY 1-49 ASSORTED		QUANTITY 50-199 ASSORTED		QUANTITY 200-499 ASSORTED	
		Coarse & Standard	Fine	Coarse & Standard	Fine	Coarse & Standard	Fine
TREE SHAPE RADIUS END							
S3JW	¼ x ⅝	8.70	9.60	8.27	9.12	7.83	8.64
S5KW	⅜ x ¾	10.40	11.50	9.88	10.93	9.36	10.35
S-437	7/16 x 1	14.50	16.00	13.78	15.20	13.05	14.40
S7PW	½ x 1	15.30	16.90	14.54	16.06	13.77	15.21
S-125	⅛ x ½	5.90	6.50	5.61	6.18	5.31	5.85
S7KW	½ x ¾	14.90	16.40	14.16	15.58	13.41	14.76
S-625	⅝ x 1	21.80	24.00	20.71	22.80	19.62	21.60
S-752	¾ x 1	29.80	32.80	28.31	31.16	26.82	29.52
S-751	¾ x 1¼	33.90	37.30	32.21	35.44	30.51	33.57
S-750	¾ x 1½	44.50	49.00	42.28	46.55	40.05	44.10
TREE SHAPE POINTED END							
T3JW	¼ x ⅝	8.60	9.50	8.17	9.03	7.74	8.55
T-312	5/16 x ¾	9.80	10.80	9.31	10.26	8.82	9.72
T-375	⅜ x ¾	10.30	11.40	9.79	10.83	9.27	10.26
T7KW	½ x ¾	14.80	16.30	14.06	15.49	13.32	14.67
T-500	½ x 1	15.20	16.70	14.44	15.87	13.68	15.03
T-625	⅝ x 1	21.70	23.90	20.62	22.71	19.53	21.51
T-751	¾ x 1	29.40	32.40	27.93	30.78	26.46	29.16
T-750	¾ x 1½	44.00	48.40	41.80	45.98	39.60	43.56
CONE SHAPE							
U-252	¼ x ½	8.40	9.30	7.98	8.84	7.56	8.37
U3JW	¼ x ¾	8.60	9.50	8.17	9.03	7.74	8.55
U-250	¼ x 1	8.80	9.70	8.36	9.22	7.92	8.73
U-375	⅜ x ⅝	11.90	13.10	11.31	12.45	10.71	11.79
U-500	½ x ⅞	16.20	17.80	15.39	16.91	14.58	16.02
U-9M-W	⅝ x ⅞	21.83	24.15	27.75	22.93	19.66	21.74
U-625	⅝ x 1	24.80	27.30	23.56	25.94	22.32	24.57
CONE SHAPE 60°							
V-250	¼	8.50	9.40	8.08	8.93	7.65	8.46
V-375	⅜	9.80	10.80	9.31	10.26	8.82	9.72
V7W	½	12.40	13.70	11.78	13.02	11.16	12.33
V-625	⅝	16.20	17.80	15.39	16.91	14.58	16.02
V-750	¾	22.50	24.80	21.38	23.56	20.25	22.32
V-12W	⅞	20.02	22.20	19.01	21.10	18.02	19.99
V-100	1	38.50	42.40	36.58	40.28	34.65	38.16
CONE SHAPE 82°							
Y-250	¼	8.20	9.10	7.79	8.65	7.38	8.19
Y-375	⅜	9.60	10.60	9.12	10.07	8.64	9.54
Y-500	½	12.20	13.50	11.59	12.83	10.98	12.15
Y-625	⅝	15.90	17.50	15.11	16.63	14.31	15.75
Y-750	¾	22.00	24.20	20.90	22.99	19.80	21.78
Y-100	1	37.50	41.30	35.63	39.24	33.75	37.17
CONE SHAPE 90°							
W-250	¼	8.00	8.80	7.60	8.36	7.20	7.92
W-375	⅜	9.40	10.40	8.93	9.88	8.45	9.36
W7W	½	12.00	13.20	11.40	12.54	10.80	11.88
W-625	⅝	15.50	17.10	14.73	16.25	13.95	15.39
W-750	¾	21.50	23.70	20.43	22.52	19.35	21.33
W-12W	⅞	19.70	21.90	18.71	20.81	17.73	19.71
W-100	1	36.50	40.20	34.68	38.19	32.85	36.18

DIAMOND CUT BURS 20% ADDITIONAL
PRICES ON QUANTITIES OF 500 OR MORE ON APPLICATION

NICHOLSON U.S.A.

NICHOLSON FILE COMPANY

NET PRICES TO CONSUMERS *(Continued)*

NICHOLSON CARBIDE BURS

DESCRIPTION AND CODE NO. CONE SHAPE R. E. 14° INCL. ANGLE	Diameter By Length	QUANTITY 1-49 ASSORTED		QUANTITY 50-199 ASSORTED		QUANTITY 200-499 ASSORTED	
		Coarse & Standard	Fine	Coarse & Standard	Fine	Coarse & Standard	Fine
		¼" SHANKS					
US-250	¼ x 5/8	8.90	9.80	8.46	9.31	8.01	8.82
US-312	5/16 x 1 1/16	10.90	12.00	10.36	11.40	9.81	10.80
US-375	3/8 x 1 1/16	11.85	13.10	11.26	12.45	10.67	11.79
US-500	½ x 1 1/8	19.40	21.40	18.43	20.33	17.46	19.26
US-625	5/8 x 1 5/16	28.60	31.50	27.17	29.93	25.74	28.35
US-750	¾ x 1½	42.00	46.20	39.90	43.89	37.80	41.58
		⅛" SHANKS					
4NBW†	⅛ x 9/16	3.70	4.10	3.52	3.90	3.33	3.69
4NCW†	3/32 x 7/16	3.70	4.10	3.52	3.90	3.33	3.69
4N062	1/16 x ¼	3.70	4.10	3.52	3.90	3.33	3.69
4N126†	⅛	3.70	4.10	3.52	3.90	3.33	3.69
4PBW	⅛ x 9/16	3.95	4.40	3.75	4.18	3.56	3.96
4PCW	3/32 x 7/16	3.95	4.40	3.75	4.18	3.56	3.96
4QBW	⅛	3.80	4.20	3.61	3.99	3.42	3.78
4Q093	3/32	3.80	4.20	3.61	3.99	3.42	3.78
4RBW	⅛ x 7/32	3.90	4.30	3.71	4.09	3.51	3.87
4S125	⅛ x ½	3.95	4.40	3.75	4.18	3.56	3.96
4SBW	⅛ x ¼	3.90	4.30	3.71	4.09	3.51	3.87
4TBW	⅛ x ¼	3.90	4.30	3.71	4.09	3.51	3.87
4UBW	⅛ x 5/16	3.90	4.30	3.71	4.09	3.51	3.87
4T127	⅛ x 3/8	3.90	4.30	3.71	4.09	3.51	3.87
4U127	⅛ x 11/32	3.85	4.30	3.66	4.09	3.47	3.87
4U125	⅛ x 7/16	3.85	4.30	3.66	4.09	3.47	3.87
4U126	⅛ x 5/8	3.85	4.30	3.66	4.09	3.47	3.87
4V125	⅛ x 60°	3.75	4.20	3.56	3.99	3.38	3.78
4XBW	⅛ x ¼	3.90	4.30	3.71	4.09	3.51	3.87
4W125	⅛ x 90°	3.75	4.20	3.56	3.99	3.38	3.78
4ZBW†	⅛ x 3/16	3.80	4.20	3.61	3.99	3.42	3.78
4M093†	3/32 x ⅛	3.80	4.20	3.61	3.99	3.42	3.78
4US125	⅛ x 3/8	3.95	4.40	3.75	4.18	3.56	3.96
4UCW	⅛ x ½	3.95	4.40	3.75	4.18	3.56	3.96
†Can be furnished with Cut End, if specified, at no additional charge.							
		3/32" SHANKS (Coarse and Standard Cuts Only)					
3N093	3/32 x 3/8	3.30	.....	3.14	.....	2.97	.....
3N078	5/64 x 5/16	3.30	.....	3.14	.....	2.97	.....
3N062	1/16 x ¼	3.30	.....	3.14	.....	2.97	.....
3P093	3/32 x 3/8	3.50	.....	3.33	.....	3.15	.....
3Q093	3/32	3.40	.....	3.23	.....	3.06	.....
3U062	10°	3.50	.....	3.33	.....	3.15	.....
3Z093	10°	3.40	.....	3.23	.....	3.06	.....
		¼" BUR ON ⅛" SHANK					
8N250	¼ x ½	6.20	6.90	5.89	6.56	5.58	6.21
8N251	¼ x 3/16	6.40	7.10	6.08	6.75	5.76	6.39
8P250	¼ x ½	6.60	7.30	6.27	6.94	5.94	6.57
8Q250	¼	6.30	7.00	5.99	6.65	5.67	6.30
8R250	¼ x 3/8	6.50	7.20	6.18	6.84	5.85	6.48
8S250	¼ x ½	6.60	7.30	6.27	6.94	5.94	6.57
8T250	¼ x ½	6.50	7.20	6.18	6.84	5.85	6.48
8U250	¼ x ½	6.40	7.10	6.08	6.75	5.76	6.39
8M250	¼ x ¼	6.25	7.00	5.94	6.65	5.63	6.30

DIAMOND CUT BURS 20% ADDITIONAL
PRICES ON QUANTITIES OF 500 OR MORE ON APPLICATION

NICHOLSON FILE COMPANY

NET PRICES TO CONSUMERS *(Continued)*

NICHOLSON CARBIDE BURS

DESCRIPTION AND CODE NO.	Diameter By Length	QUANTITY 1-49 ASSORTED		QUANTITY 50-199 ASSORTED		QUANTITY 200-499 ASSORTED	
		Coarse & Standard	Fine	Coarse & Standard	Fine	Coarse & Standard	Fine
		¼" BUR ON 3/16" SHANK (Standard Cut Only)					
9N250	¼ x ½	6.30	.....	5.99	.....	5.67	.....
9N251	¼ x 3/16	6.50	.....	6.18	.....	5.85	.....
9P250	¼ x ½	6.70	.....	6.37	.....	6.03	.....
9Q250	¼	6.40	.....	6.08	.....	5.76	.....
9R250	¼ x ⅜	6.60	.....	6.27	.....	5.94	.....
9S250	¼ x ½	6.70	.....	6.37	.....	6.03	.....
9T250	¼ x ½	6.60	.....	6.27	.....	5.94	.....
9U250	¼ x ½	6.50	.....	6.18	.....	5.85	.....
9M250	¼ x ¼	6.40	.....	6.08	.....	5.76	.....
		5/32" & 3/16" BURS ON ⅛" SHANK					
5N156	5/32 x ½	7.00	7.70	6.65	7.32	6.30	6.93
5N187	3/16 x ½	7.10	7.80	6.75	7.41	6.39	7.02
5P156	5/32 x ½	7.30	8.00	6.94	7.60	6.57	7.20
5P187	3/16 x ½	7.40	8.20	7.03	7.79	6.66	7.38
5Q187	3/16	7.20	7.90	6.84	7.51	6.48	7.11
5RT187	3/16 x ⅜	7.50	8.30	7.13	7.89	6.75	7.47
5M187	3/16 x ¼	7.40	8.20	7.03	7.79	6.66	7.38
5U187 14°	3/16 x ½	7.60	8.40	7.22	7.98	6.84	7.56
5R187	3/16 x 9/32	7.50	8.30	7.13	7.89	6.75	7.47
5S187	3/16 x ½	7.50	8.30	7.13	7.89	6.75	7.47
5T187	3/16 x ½	7.40	8.20	7.03	7.79	6.66	7.38
5U187 16°	3/16 x ½	7.20	7.90	6.84	7.51	6.48	7.11
		3/16" BUR ON 3/16" SHANK					
6N187	3/16 x ⅝	6.50	7.20	6.18	6.84	5.85	6.48
6P187	3/16 x ⅝	6.70	7.40	6.37	7.03	6.03	6.66
6Q187	3/16	6.60	7.30	6.27	6.94	5.94	6.57
6R187	3/16 x 9/32	6.80	7.50	6.46	7.13	6.12	6.75
6S187	3/16 x ½	6.90	7.60	6.56	7.22	6.21	6.84
6T187	3/16 x ½	6.90	7.60	6.56	7.22	6.21	6.84
6U187	3/16 x ⅝	6.90	7.60	6.56	7.22	6.21	6.84
6V187	3/16	6.60	7.30	6.27	6.94	5.94	6.57
6RT187	3/16 x ⅜	6.80	7.50	6.46	7.13	6.12	6.75
6W187	3/16	6.60	7.30	6.27	6.94	5.94	6.57
6M187	3/16 x ¼	6.80	7.50	6.46	7.13	6.12	6.75
6US187	3/16 x 7/16	6.90	7.60	6.56	7.22	6.21	6.84

NICHOLSON CARBISETS

CODE NO.	DESCRIPTION	NET PRICE PER EACH	
		Coarse & Medium	Fine
NO. 100	1 each of twelve ⅛" diameter shank solid Carbide Burs in mahogany box	47.25	54.50
NO. 105	1 each of twelve ⅛" shanks with assorted 5/32" and 3/16" heads in mahogany box	88.20	98.70
NO. 106	1 each of twelve 3/16" shanks with 3/16" heads in mahogany box	84.00	94.50
NO. 108	1 each of nine ⅛" shanks with ¼" heads in mahogany box	60.70	67.20
NO. 109	1 each of nine 3/16" shanks with ¼" heads in mahogany box (Standard Cut Only)	61.90	.....

REGRINDING OF HIGH SPEED STEEL BURS & CARBIDE BURS
PRICES ON APPLICATION
PRICES ON QUANTITIES OF 500 OR MORE ON APPLICATION

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FORM NO. 790